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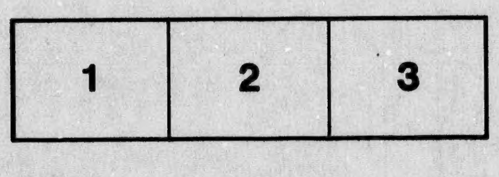

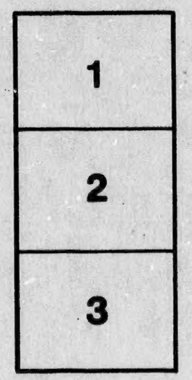

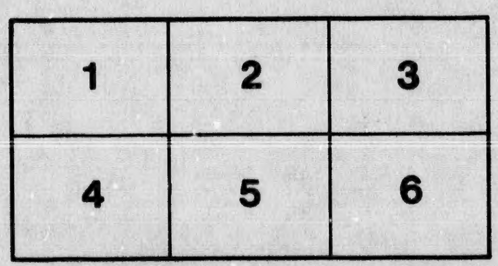

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THE CANADIAN
BEE-KEEPERS' GUIDE:

An easy method of managing Bees by the use of Thomas' Patent Moveable Comb Bee Hive.

BY J. H. THOMAS,

OF THE FIRM OF J. H. THOMAS & BROS., BROOKLIN, C. W.

THIS WORK IS DESIGNED TO MEET THE WANTS OF THE PRACTICAL
BEE-KEEPER IN CANADA, BY GIVING THE NECESSARY
INFORMATION FOR THE MANAGEMENT OF
BEES IN THIS CLIMATE IN MOVE-
ABLE COMB HIVES.

SECOND EDITION, REVISED AND CORRECTED.

more

BROOKLIN

TORONTO:
AT THE GLOBE STEAM JOB PRESS, 26 KING ST. EAST.
1866.

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PREFACE.

As there is an interest being awakened in Canada in that very pleasing department of rural economy, bee-keeping, I take pleasure in offering to the public this little work, as a kind of introduction to a larger work to follow hereafter, as soon as the results of certain experiments now going on shall be fully known.

As other works on bee-keeping have been written by men living in a different climate from ours, it cannot be expected that they are in all respects adapted to this country. I have, therefore, endeavoured, in this work, to meet the wants of practical bee-keepers in Canada, by setting forth an easy method of managing bees in moveable-comb hives. I have also endeavoured to divest bee-keeping of a great amount of ignorance and superstition by which it has been enshrouded in all ages.

Though the work is small, I have sought to touch upon all important points in a manner, I trust, to make them sufficiently plain to be easily understood.

If those just commencing bee-keeping will but follow the simple rules and advice I have given, they may be sure of some degree of success; while the more experienced apiarian will be led to acknowledge that improvement is the order of the day.

I furthermore ask an impartial trial of my hive, a full description of which I have given in this work; believing, as I do, that while its extensive sale may prove somewhat remunerative to myself, its extensive use will prove even more so to those who purchase.

J. H. THOMAS.

BROOKLIN, C. W.

b1923

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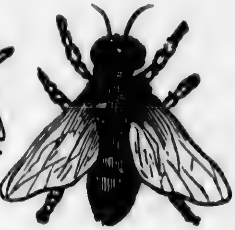
THE

CANADIAN BEE-KEEPERS' GUIDE.

QUEEN.

WORKER.



DRONE.

CHAPTER I.

The Natural History and Description of the Honey Bee.

THE HONEY BEE is said to have originated in Greece, though Hugh Miller, in his "*Testimony of the Rocks,*" claims that it has been in existence from the earliest dawn of creation. Be that as it may, it has spread over most of the habitable globe. For more than three thousand years it has attracted the attention of naturalists, moralists, and divines, as well as the labouring man and enquiring minds of all classes. The Germans imported the bee from Italy, and copying their hive from Greece, have in some cases a thousand colonies to the square mile, and the government encourage their culture. It is said the honey bee came with the Puritan Fathers to the New World in 1670, and followed their descendants to California in 1853 from whence come almost fabulous accounts of their prosperity.

Every garden should be enlivened by their gentle hum. Every flower that decks this brown earth with its varied hues, and perfumes the atmosphere with sweet fragrance, should be daily visited by the busy bee, for which its fountains of nectar burst forth, and its golden cup is filled. Thus every household may be furnished with the delicious sweets of every blooming field and forest, which otherwise would run to waste. The improvements of latter days have enabled man to appropriate to himself the abundance of their stores, which otherwise would be gathered for naught, without resorting to the cruel practice of murdering whole colonies. The ever busy bee, that now no longer labours in vain, deserves our kindest attention and warmest thanks for the luxury it brings us; and whoever may keep bees and devote a small portion of time to the study of their nature and habits, will not only be profited and amused, but highly instructed, for even the wisest may learn many a lesson of economy and industry from

A Colony of Bees,

which, in a perfect state, consists of three kinds.

1st. The queen, or female—the mother of the whole family.

2nd. The drones, or males—"*The lazy fathers of the industrious hive.*"

3rd. The workers or neuters—the bone and sinew of the hive.

A medium swarm contains about 15,000 bees, and weighs about 4 lbs.

A good swarm contains about 25,000 bees, and weighs about 6 lbs.

A large swarm contains about 30,000 bees, and weighs about 7 lbs.

Some colonies, just before swarming, contain 40,000 and 50,000.

The Government of Bees

Is not, as is generally supposed, a monarchy, for the queen has no more to do with the government than any other bee in the colony. Each bee instinctively fills its own sphere, without any discord arising in the family. If more power or authority is invested in one bee than another, it is in the workers, which destroy the drones, limit the power of the queen to increase her progeny, by filling up the brood cells with honey, and raise young queens, guarding them against the attacks of the old queen, until at last she leaves the colony with all that feel disposed to go with her, which is called swarming.

Description of the Queen.

The queen is longer than either drone or worker, but not as large as the drone; her body is longer than either of the others; her abdomen is much longer and tapers to a point; her legs are longer than either drone or worker, but have no cavities for carrying *pollen;* her wings are quite short, covering but two-thirds of her length; her back is darker than the workers, but her belly is more of an orange colour; her movements are quick and shy, when she desires to conceal herself from man; at other times majestic and stately. She has a sting much longer than the workers, yet she is perfectly safe to take in the hand, for she seldom uses her sting, except in case of a deadly strife with a rival queen. She seldom helps herself to food; the workers feed her every few minutes. Her purpose seems to be to propogate her species, and sometimes lead off in swarming. She generally lives to the age of four or five years, becomes worthless, and dies.

Description of the Drones.

The drones, or male bees, are the largest of the stock; they are thick and clumsy, and about twice the size of the workers; their heads and trunks are covered with thick hair; their wings are longer than the workers, extending the entire length of the body; their trunks, or bills are shorter than the workers'; they have no cavities on their legs for carrying *pollen;* they have no stings, and are never seen gathering food of any kind, nor even water; they can afford to eat and drink only what is brought to them, which is no small quantity. They are, as saith the poet, "*The lazy fathers of the industrious hive,*" living on the fat of the land in perfect indolence, coming out but once a day for pleasure or pastime. Though they are the male bees, probably not one in a thousand performs the duty assigned such, and he dies immediately after cohabiting with the queen.

When Drones Appear.

They generally make their appearance about the first of May earlier or later, according to the climate and season. The more abundant the honey, the more drones are to be found in numbers, about one to twenty of the workers. Generally, they only live from two to four months, but if not destroyed by the workers, they might possibly live eight or ten months.

Description of the Workers.

The workers or neuters are the smallest bees in the colony, shaped more like the queen than the drone, and well proportioned. They have four wings and six legs; their abdomen is composed of six scaly rings, something like fish scales; they have cavities on their legs for carrying *pollen* or bee bread; they have a honey-bag or stomach for the purpose of carrying honey or any sweet which they may gather, that holds about a drop. Their eyes are located in the upper part of the head, and do not turn in their sockets, but are stationary. When they view an object they are obliged to face it. They are armed with a fearful weapon, a sting, which nature has kindly furnished them for their preservation. But I do not believe it was intended to be used against man, and bees, properly treated, are not very likely to sting wilfully. Their purpose is to gather honey, *pollen*, *propolis*, or bee glue, bring water, construct the cells, repair damages, nurse the brood and rear the queens. In fact they are the bone and sinew of the hive. During the honey harvest no time runs to waste, knowing that their days for labour are few, especially in most parts of Canada, and all northern latitudes. When the sun is up every one that can be spared is on the wing, traversing field and forest in search of every flower that yields the sweet morsel, until the day is spent. They generally live from six to eight months.

Number of Journeys in a Day.

A single colony in Germany has been known to make 215,040 journeys in a day, laying in store 28 lbs. of honey, and one in the United States owned by Mr. Wilcox, of West Bloomfield, N. Y., made 153,600 journeys in a day, laying in store 20 lbs. of honey. Truly they are the "busy bee."

Reproduction of the Worker.

Every month in the year worker brood may be found in a strong colony, the least being found in the month of December, and the most in the months of June and July. Workers are produced from impregnated eggs laid by the queen or mother bee.

Time required to develop a Worker.

The time required to produce or develop a worker bee from the egg is about twenty days from the day of laying. In about three days the egg is hatched ; it then remains about five days in the *larvæ* or grub state. During this time it receives the unremitting care and attention of the workers, being nursed and fed all it will eat.

Food of the Worker Larvæ.

The food consists of honey, *pollen* or bee bread and water, and is compounded by the nurses of the *larvæ*. After about five days the *larvæ* stops eating, its food is then cut off and the cell is sealed over. It at once commences to spin around itself a thin silky substance called a cocoon, which takes about thirty-six hours ; in three days more it is changed to a *nymph* or *pupa;* remains about six days in the nymph state, in which it gradually undergoes so great a change as not to wear a vestige of its previous form. On the twentieth day it comes forth a perfect bee. The silken cocoon is left behind, forming a closely attached lining to the cell in which it was spun.

Attention paid to Young Workers.

It has been supposed that great attention is paid to the young workers, that the older bees or nurses lick them all over, feeding them and coaxing them out to work. Such, however, is a mistake. There is no attention paid to them whatever. Even when emerging from their cells, they are often run against by the workers in such a manner as to almost dislocate their necks. They are forced to draw back, out of danger, and when they have finally made their escape from the cells, they are forced to seek their own food and provide for themselves, as not a friend has a morsel to offer, even upon the same day they enter upon the duties of life. The bees sometimes seen upon the lighting-board around which are gathered several bees apparently licking them all over, and which some have taken for young bees, are *robber bees*, and instead of being kindly treated, they are held prisoners, and by the continual biting, instead of licking, which they receive, are forced to deliver up whatever honey they may have, and then are either set at liberty or unmercifully despatched.

Sex of Workers.

Workers are sometimes called neuters, that is neither male nor female, but they are properly undeveloped females, which are incapable of becoming impregnated; and their *ovaries*, or egg-bags, are so imperfectly developed that, under ordinary circumstances, they are incapable of breeding; retaining, however, so much of the instinct of females as to become the nurses of the brood, which they tend with the greatest care.

Workers lay Drone Eggs.

In some cases, however, worker bees become so far developed, by receiving a portion of royal jelly, as to be able to lay drone eggs, which are eggs unimpregnated; for as workers cannot become impregnated, it follows that any eggs which they may lay are unimpregnated eggs, and all such eggs are found to produce drones only. It sometimes happens when a colony has lost its queen and cannot produce another, that drone-laying workers are allowed to take her place; but as they can never lay anything but drone eggs, they are worse than useless. Doubtless such laying workers are nursed in cells near the queen cell, which may account for their obtaining a portion of the royal jelly.

Reproduction of the Drones.

As it has already been remarked, drones, or male bees, are produced from unimpregnated eggs, which, if the season is favourable, the queen commences to lay about the first of May.

How Produced from Unimpregnated Eggs.

The question is often asked, how can an unimpregnated egg produce a drone? While it may be difficult to tell how, yet such is a fact long since established. However, I conclude that all unimpregnated eggs laid by the queen bee have, from the previous impregnation of the egg from which she sprung sufficient vitality to produce the drone, which is a less highly organized insect than the queen or worker.

Time Required to Develop a Drone.

A drone is generally developed in about twenty-four days, counting from the day the egg is laid. The gentleman passes three days in the egg; six and a half as a grub, or *larva*, and is perfected about the twenty-fourth day.

Why are so many Drones required?

The question is often asked, Why are so many drones produced, if only one has coition with each queen? The reason is this: The queen is always impregnated on the wing, and in order to insure her impregnation, it is necessary that many drones should be on the wing when she takes her bridal tour, in order that she may be sure to meet with one. When the weather is favourable, drones leave the hive in search for queens from 12 to 4 o'clock each day.

Drones destroyed by Workers.

After all swarming is over, and the honey harvest begins to fail, the drones are destroyed by the workers. At first an effort is made to drive them from the hive, and especially from those portions of comb which contain honey. This continues for several days; but the drones are not so easily to be disposed of, clustering together in large numbers, as if for mutual sympathy.

They bear their persecution nobly. But the workers, becoming more in earnest, drag them from the hive, cut their wings, and push them off the lighting board, till at last the work of destruction commences in good earnest, and the workers unmercifully despatch them with their stings. In Canada, the general massacre takes place in August, though a scarcity of honey may bring it on sooner, or an abundance may put it off till later.

Reproduction of the Queen.

Generally about twenty days after drone eggs are laid, queen cells are commenced by the worker bees (from two to twenty are started, and sometimes even more), and the rearing of queens commences.

Produced from a Worker Egg.

Her royalty has nothing to do with producing herself a rival. She simply lays worker eggs, which, any time before they are hatched, which is within three days from the time they are laid, can be changed to royalty by the worker bees. There is no difference between the egg that produces a worker, or imperfect female bee, and the egg that produces a queen, which is a perfect female bee. The difference between the two bees is entirely the result of the treatment which the *larva* receives and the size of the cell in which it is nursed. The food of the worker *larva* is compounded of bee-bread, honey and water, and the cell is small, lying in a horizontal position; while the food of the royal *larva* is a creamy-like substance or jelly, different in taste, being more pungent. How it is prepared is still a question, but by some quality it possesses it changes the nature of the *larva* from a worker to a queen bee, by developing organs of reproduction which, in the worker, remain undeveloped.

Queen Cell.

The queen cell is also much larger than that of the worker, being in size and shape like a pea-nut. It hangs vertical in the combs, which causes the queen to be developed with her head downwards, and allows the organs of reproduction to be fully developed. The queen cell is sometimes built around the egg, and at other times the egg is carried by the workers and placed in the cell.

Time required to Develop a Queen.

A queen is developed from an egg in about sixteen days, reckoning from the day the egg is laid. Her royalty passes three days in the egg, five days a grub or *larva*, during which time the workers deposit so much food in the cell that the *larva* fairly floats in the jelly-like mass. The cell is then closed by the workers, and the *larva* commences to spin its cocoon, which occupies one day. The tenth, eleventh, and part of the twelfth, it remains in complete repose; then the transformation takes place, in which four or five days are passed, and, generally, on the sixteenth day, the perfect state of the queen is attained. When she first emerges from the cell she seeks her own food like any other bee, and no very particular attention is paid to her until after her impregnation; but as soon as that has taken place she is constantly attended by the worker bees.

The Queen's Attendants, or Train,

Are not certain bees detached from among the workers for this special purpose, as is stated by some writers, but wherever the queen moves among the crowd those bees nearest to her at once become her attendants, and feed her every two or three minutes.

Impregnation of the Queen.

The queen makes her bridal tour in from two to ten days after issuing from the cell. In rare cases it may be longer. Generally, however, within five days she may be *confidently* looked for to issue from the hive, between the hours of 12 and 3 o'clock P.M., when the drones are flying most abundantly. As before remarked, impregnation takes place on the wing. The celebrated Huber, in 1788, instituted a course of experiments on the subject of the queen's impregnation, the result of which led him to the conclusion that it took place on the wing high in the air. Though it has generally been conceded by German apiarians since Huber's time that such was the case; yet with all their endeavours they never had the privilege of witnessing the act of coition between the queen and drone; that seems to have been reserved for our cousins across the water. It was first witnessed in June, 1859, by the Rev. Mr. Millette, of Whitemarsh, Pa.; and on the 8th of July, 1861, by Wm. W. Carey, of Coleraine, Mass., and R. B. Otis, of Kenosha, Wisconsin, at Mr. Carey's apiary. For particulars see *American Bee Journal*, for 1861. As soon as the queen meets with a drone she returns to the hive, to leave it no more until she goes off with a swarm. She may not, however, meet with a drone the first time she goes out; if not, after having been on the wing for a short time, she returns to the hive, where she remains a little while, and then makes another tour. This she continues to do every day until she becomes impregnated.

Queen Commences to Lay.

From two to five days after impregnation she commences to lay, which seems to be the sole purpose of her existence; and if she meet with the drone within twenty-nine days from the time she issues from the cell, she will be a fertile queen, laying both worker and drone eggs.

A Fertile Queen—How Told.

"A fertile queen lays her eggs in regular order, commencing at a point and distributing them in circles, each surrounding the first, and on both sides exactly alike. Sealed worker brood should present a regular smooth surface." *Bee Culture,* pp. 162, 163.

An Unfertile Queen—How Told.

An unfertile queen is one that lays drone eggs, and may be known by an irregular brood. A number of raised oval cells in worker comb shows the presence of drone brood, and indicates a drone-laying queen; one that is old and approaching barrenness, or a case of

Retarded Impregnation.

If the queen, by some misfortune, does not become impregnated within the first twenty-one days of her existence, she never makes anything more than a drone-laying queen. Here we see the wisdom of the Creator in the provision of so many drones. The chances for the queen to be destroyed are many—the time for her impregnation short—hence the necessity of her meeting with a drone as soon as possible, and which she might never do if only a few existed. But being once impregnated, it is for life. She remains fertile for three, and frequently four years, after which she will lay, principally, drone eggs. It is better then to destroy her and give to the bees a young, fertile queen, or they will produce another, if they have any worker eggs unhatched, which can easily be seen in a moveable-comb hive.

A Fertile Queen Lays both Impregnated and Unimpregnated Eggs,

This may appear strange; it is nevertheless true. The impregnating, or seminal fluid, received by the queen from the drone, is contained in a small sac called the *sperm reservoir*, or *spermatheca*, which communicates with the *oviduct* through which the eggs pass to be deposited in the cells. Therefore, when the eggs leave the *ovaries*, or egg-bags, they are unimpregnated, but in passing through the *oviduct* all eggs that produce workers or queens are brought in contact with the mouth of the sac containing the seminal fluid, and receive a portion of it, which impregnates them; while the egg that produces a drone passes through the *oviduct* without coming in contact with the seminal fluid. Whether the queen has the power to bring the egg in contact with the mouth of the sack at will, or whether it is brought there by the body being compressed when laying in a worker cell, is a question yet unsettled. My own opinion is, that she has the power, and instinctively closes the mouth of the sac when laying in drone cells; for she may often be seen laying first in a drone cell and then in a worker cell alternately, and yet seldom, if ever, makes a mistake, the egg laid in a drone cell producing a drone, and that in a worker cell a worker.

CHAPTER II.

Philosophy of Swarming—Honey—Pollen or Bee-Bread—Propolis or Bee-Glue—Wax or Bee-Comb.

Though bees have been kept for ages in the past, yet at the present day probably there is not more than one out of ten of those who keep bees but what is ignorant of the nature of swarming. I shall, therefore, in this chapter endeavour to show briefly why stocks throw off swarms, and speak of the general characteristics of swarming.

First Swarm.

When a hive becomes full of comb, honey, bee-bread and brood, the queen has no longer sufficient room to deposit all her eggs, and the workers require more room to store their honey, preparation is therefore made for swarming. This is done by the workers who instinctively commence the rearing of young queens. For, be it remembered, if young queens are not reared no swarming will take place, though they may be ever so much crowded for room. Hence it is not altogether true that bees swarm for want of room. No stock will ever cast a swarm unless the queen will leave, and she will never leave unless rival queens are being reared.

The old Queen goes with the first Swarm.

The queen finding the breeding cells all occupied and the rearing of young queens commenced, becomes much agitated. Day by day she becomes more restless, and not being able to destroy the young queens which are now well guarded by the workers, she runs rapidly over the combs; sometimes stopping upon the side of a comb and dropping her eggs among the workers who greedily devour them. The workers also partake of the excitement, a few at first, the number gradually increasing, running rapidly over the combs striking their antennæ at each other. As soon as one or more of the queen cells are capped over, the excited bees, as if by pre-concert, rush to the honey-cells and fill themselves with their precious stores. After each bee has partaken to the full, wind and weather permitting, they rush from the hive in a perfect cloud, as if the halls of pandemonium had been let loose among them, the old queen *always* going with them, sometimes leading out the swarm.

But few Drones go with first Swarm.

But few drones go with the first swarm, as the old queen is already impregnated for life, hence they are not required. Instinctively they remain with the parent hive where the young queens are being reared.

Second Swarm.

When the first swarm is cast, the parent hive is left without a queen, but several are fast being developed. As before remarked, one or more of the queen-cells are generally sealed over before the old queen leaves; in eight days the oldest of the young queens emerges from the cell; the next day, a second swarm may be expected if all is favourable; that is if the stock intends to cast a second swarm.

Piping of the Queens.

Generally, at evening, on the day before the second swarm issues, may be heard what is called the piping of the queens, which is a "cry of war." Suppose a first swarm issued on Saturday, a week from the next day, at evening, if you put your ear close to the hive the piping may generally be heard.

Cause of Piping.

As before remarked, piping is a cry of war; as soon as the first queen emerges from the cell, she seeks the cells containing her sister queens; but if the workers intend to swarm, a guard has already been placed around them. Finding she cannot reach them, she commences piping, and is generally answered by the next older queen yet in the cell, but ready to emerge in a day or two. The queen finding that she cannot destroy her rival, and perhaps dreading a battle, like her mother before her, determines to leave, and accordingly the next day after piping issues with a second swarm.

Time not always the same.

I wish to be understood that when I speak of the time or day when anything will take place, it is in a general sense, as wind and weather, as well as other things, cause the time to vary.

Quinby on the time of Piping.

Says Quinby, "I never failed to hear it previous to a second swarm whenever I listened. The time of commencing will be later than this rule in some stocks: if the weather is unfavorable or not many bees left, it may be ten or twelve days (after the first swarm); I once found it fourteen before I heard it. Also the swarm may not issue in two or three days after it is heard." Such are exceptions to the general rule.

Third Swarm.

The same scene is again enacted in case of a third or more swarms. The time, however, that intervenes between the second and third swarms is much shorter, generally not exceeding three or four days. Piping for third swarms may usually be heard the evening after the second has left.

Two or more Swarms issue together.

Sometimes the second, third, and even fourth swarms may all issue at the same time and cluster together, each having a queen, which accounts for what inexperienced bee-keepers suppose to be one swarm, with two or three queens. The truth is, there are just as many swarms as there are queens, all issuing at or near the same time, and is accounted for in this way: the first queen that emerges from the cell after the first swarm is cast, and which should have constituted the queen of a second swarm, is prevented by bad weather or some other cause, from issuing with her swarm until a second or even a third queen has emerged from their cells; each queen being guarded by a distinct and separate cluster of bees, until a favourable opportunity offers, when all issue together, forming what is often called "one swarm with two or three queens," whereas under favourable circumstances, each queen and cluster would have issued separately, forming distinct swarms, though often quite small.

Swarms Issue and Return.

It sometimes happens that a swarm will issue and cluster, remain for a short time and then return to the hive from which they issued. In such a case the queen did not issue or was lost. Sometimes a wing is defective, and not being able to fly well, she falls to the ground; sometimes she remains behind, and in the confusion of swarming, gains access to the queen-cells and destroys the young queens. In that case, if it was a first swarm, they would not issue again for eight or ten days, if at all.

How long may Swarms be expected?

Swarms may be expected for eighteen or twenty days after the last first swarm (called by some top-swarm) has issued. After that time it is useless to expect any more swarms. In certain cases, however, the buckwheat or fall honey harvest may cause a very strong stock to cast a swarm. Such, however, should be looked upon as a first swarm; for a stock casting a swarm in the fall under such circumstances, is found to be in the same condition that it was when it cast a first swarm in the spring. The amateur in bee-keeping, understanding the rule given above, will not feel uneasy about his bees, every time they hang out or play "mock swarming," by rushing out of the hive in great confusion after the time above-mentioned has expired.

Destruction of Young Queens.

When the worker-bees decide to swarm no more, all queens are destroyed. This is generally done by the first queen that emerges from the cell after the last swarm has issued, and generally while her sister queens are still in the cells. The workers having decided not to swarm, the guards or clusters around the different cells disperse, leaving the young queens exposed to the mercy of the queen already emerged. She is not long in perceiving this, and rushing to the cells makes an opening in the side and stings her much dreaded rivals to death, the workers standing quietly by beholding the deed of death without ever attempting to prevent it; after which they drag out the dead queens and return to their labour. Let it be remembered that all queen-cells that are found open at the side have had their inmates destroyed, while all that are found open at the end—uncapped—are cells from which a perfect queen has emerged.

Honey.

Honey is a sweet juice secreted in the nectaries of flowers. Some secrete more, some less ; but there is one peculiarity of all, their golden cups may be exhausted to-day, to-morrow they are replenished. Hence, when the season is favourable, the supply cannot easily be exhausted.

Different Qualities.

Honey is of different qualities. Some kinds are very unpleasant, others very unwholesome, being gathered from poisonous flowers. The most delicious are gathered from the sugar-maple, linden, or bass-wood fruit trees, and especially from clover and Canada thistles. Buckwheat yields a large supply, but it is quite unpleasant.

Honey not Made.

Many have supposed that honey was made by the bees out of that substance which they gather. Such, however, is not the case. That which they gather from the nectaries of flowers is honey ; for all honey is a vegetable product, each kind partaking of the nature of that from which it is gathered, and undergoing no particular change in the honey-bag of the bee. Hence it is not difficult to tell from what several kinds are gathered by the taste ; among which are those gathered from the basswood, buckwheat, asparagus, clover, and Canada thistle. Each kind is also kept distinct and separate by the bees, never being mixed to any great extent.

Artificial Honey

Of a superior quality may be made thus :—White sugar, 2lbs.; strained honey, 1lb.; water, one pint. Put in a tin, brass, or enammelled kettle, and bring to a boiling heat and skim. When cool it is fit for use.

Pollen, or Bee Bread,

Is the vivifying dust of flowers, and gathered by the workers in little pellets in the cavities or baskets on their legs. It is deposited in the cells by the bee that gathers it, and packed by other worker bees until the cell is two-thirds full, when it is generally covered by honey, probably to keep it moist. It is of different colours, varying according to that from which it is gathered. Mixed with honey and water it becomes the food of the *larvæ*. It is the first thing gathered in the Spring. I observed my bees bringing it in to-day (April 6th) for the first. I judge by the taste that it is gathered from the soft-maple. It is being gathered earlier than usual this season in this section of the country. A good substitute is oatmeal, rye, or buckwheat flour, placed in a dish where the bees can get it early in the Spring.

Propolis, or Bee Glue,

Is the resin or gum that exudes from different trees, and is gathered by the workers like pollen in the cavities on their legs. The pellet, as it appears on their legs, is generally round, and not oval like pollen. It is gathered from the pine, the balsam, the cedar, the Balm of Gilead, or from any other tree or shrub from which gum or resin exudes. By catching a bee and taking off the pellet, the kind it is gathering may be known by the taste. The bee that gathers it does not apply it, but runs through the crowd and other bees take it off from its legs with their mouths, and apply it where it is needed, and many times where it is not needed.

Wax, or Bee Comb,

Is a natural secretion of bees from honey or any liquid sweet. During the season of comb-building it may be seen coming out between the rings of the abdomen of the worker bees, where it is secreted, in small white scales. Sometimes six scales may be seen at the same time on a single bee. It is produced in a similar manner as tallow is produced from the food that the creature eats; and as it takes a large amount of food to produce one pound of fat, or tallow, so it takes a large amount of honey or sweet to produce one of comb, or wax. It requires from fifteen to twenty-five pounds of honey to produce one pound of comb. In building comb the bees scratch out the scales with their hind legs and then with their mouths mould it to their liking. Scales of wax may be seen on the bottom board of any hive where comb-building is going on. Bees fed on the darkest kinds of sugar will produce just as pure white comb as if fed on the purest honey.

Cells of a Honey-comb

Are of different sizes. The worker cells are the smallest and less than half an inch in length, and five to the inch each way, making twenty-five to the square inch on both sides of the comb. Drone cells are a little over half an inch in length, and four to the inch each way. Store cells are of different lengths and different sizes, adapted to the situation in which they are constructed. All cells, however, are used for storing honey, more or less, except queen cells, which are constructed over an inch in depth, and about the size of a pea-nut. After the queens are hatched they are generally cut down to about one-third their natural length and no use made of them.

CHAPTER III.

General Management.

It is to be regretted that there is so much superstition connected with the management of bees---so much in almost every operation that is superfluous and uncalled for. The using of a white cloth in hiving; the blowing of horns, rattling of bells, and throwing dirt to cause a swarm to cluster; the washing of hives with salt water, the examining of hives to see that no nail appears on the inside, are among the superfluities of bee-keeping—in the fullest sense of the word, uselees; and belong, with the notions that successful bee-keeping is "luck," that bees will not prosper where man and wife disagree, that bees will dwindle away and die if not informed of every death in the family, to the dark ages of superstition and folly. Equally so does the idea that bees may be charmed, that the experienced apiarian who at state or Provincial Fairs handles his bees as if they were flies, possesses any power to control them more than any man or woman may acquire by understanding their nature and habits. So long, however, as bee-keepers will continue to use the common or box hive, and neglect to study their nature and habits, they must remain in comparative ignorance of the honey-bee, and of the proper method of managing them. Only by using moveable comb hives can the apiarian have perfect control of the busy bee, which is highly necessary in order to manage them properly. I shall, therefore, in this chapter present to the bee-keepers of Canada an easy method of managing bees by the use of my hive, which possesses all the advantages that can possibly be obtained in any moveable-comb hive. It is simple in construction, and far easier to operate with than any other hive ever offered to the public. (See Opinions of the Press.)

Location of the Apiary.

Bees properly managed will be well located. No man would think of setting his stocks where they would be constantly exposed to bleak winds without some kind of protection. To select a good location, then, for the apiary is a part of good management Stocks should always face the South, as that allows them both the morning and evening sun. They should be protected from North winds, and, if single boarded hives are used, shaded from a noonday sun. With my double boarded hive no protection from the sun is necessary.

Articles Convenient for an Apiary.

An old table, or a cheap one made for the purpose, for hiving; hiving dish, it may be a pan, pail or basket, of convenient size to hold a cluster of bees; bee-protector or bee-hat, bee-gloves, a good wing, fumigator or smoke-pipe, bee-sprinkler (a common water sprinkler will do), honey-knife, old dry wood, tobacco or puff ball. I would not be understood to say that these things must be kept especially for the apiary, for they may be found or a substitute in almost every family. Those, however, who take pleasure in having everything in its proper time and place will, of course, require them. The expense is trifling, and with proper care they will last a lifetime. (See price list of articles for the apiary.)

Smoke: its Effects.

Smoke is quite necessary in managing bees, and should always be ready, especially in hot weather, when bees are irritable. Sweetened water is also good to quiet them, by sprinkling it upon them. Nothing, however, equals smoke for all purposes; and it is the cheapest. I would not say they cannot be managed without smoke, for I often do so myself; but I consider it better to use it, as it gives the apiarian better control over them, and does them no injury. Any kind of smoke will answer. Made of old rotten wood or chips, in a shallow dish, and blown in among the bees with the mouth, it will cause them to fill themselves with honey, and then they can be handled in any manner you please. Tobacco is more powerful, and dried puff ball still more so, soon stupifying them. With my fumigator, or smoke pipe, and rotten wood, a swarm may be subdued in two minutes.

How to Approach Bees.

The apiarian should always approach his bees slowly, but fearlessly. There should be no quick motions with the hands, no striking at bees; if they grow saucy, never mind, stand boldly to the work and awe them into submission. If you cannot do this without put on a bee-protector; it is simple and of trifling expense;

can be worn by either lady or gentleman, and with care will last a lifetime. (See list of prices.)

How to Operate with a Swarm of Bees.

When anything of importance is to be attended to, such as removing comb-frames, artificial swarming, examining for a queen, &c., the stock to be operated upon should be removed from its stand, four or five rods, then all straggling bees, which are the most ready of all others to thrust in their sting, will fly about the stand looking for the hive and not trouble you. Having removed the hive treat the bees to a little smoke, rap on the hive a few times, wait a few minutes and then commence operations, for a child may handle them now.

Natural Swarming.

It is very important in managing bees to understand swarming, in order to be prepared for every emergency. I would, therefore, refer the amateur to chapter II. "Philosophy of Swarming," which should be read carefully. Before the swarming season arrives it is highly necessary that everything be in readiness that there may be no hurry nor confusion when a swarm issues. In order to make such preparations it is necessary to know the

Time when Swarming may be Expected.

In Canada, swarming may be looked for from the fifteenth of June until the fifteenth of July, on any pleasant day, from 9 o'clock in the morning until 4 o'clock in the afternoon. In some localities when the season is favourable, swarms may be expected any time after the first of June, and in very rare cases, from strong stocks, swarms may issue the last of May. Therefore, in order to be safe, all preparations should be completed by the first of June.

Preparation of Hives for Bees.

Hives that have been used should be well cleaned and scalded; all lumps of bee-glue and comb should be scraped off. If there is comb in the frames it should be well cleaned. If the frames are new take a piece of bees-wax and rub two or three times along the sharp bottom edge of the top piece of each frame, but if the bees-wax is not convenient, never mind it, for I have never known the bees to build their combs crooked in my hive, when the bees-wax was not used. Examine all hives, see that the frames are in their bearings all right; then put on the honey-board, turn the honey-boxes bottom side upwards, so that the bees cannot get into them, put on the covers, keep in a cool place, and they are ready for use. As before remarked, washing with salt water, honey and water, &c., is superfluous—*of no use whatever*.

Signs of a First Swarm.

There are no signs by which the apiarian can predict the certain issue of a *first* swarm, especially in a box-hive. When the hive is full and many bees hang out, a swarm may be looked for, yet it may not come. Moveable comb hives may be examined, and if eggs are deposited in the queen-cells, a swarm may be expected within a week; if the eggs are hatched, a swarm may be expected within four or five days.

Hiving—How to Operate.

As soon as the bees have clustered, bring out a table (a cheap one may be made for the purpose), near to the cluster; if you are superstitious, spread on a white cloth; if not, leave it off, as it is of no use whatever; place your hive on the table and drop down the bottom board at the back of the hive; now take a pan, basket, or any dish large enough to hold the bees, and shake the bees into it, if they are clustered on a limb, but if on the fence, or on the body of a tree, take a wing and carefully brush them into the dish; then turn them out on the table, close to the hive, and they will soon enter. If any should cluster again, shake or brush them off as before; soon all the bees that are flying will gather about the hive. You can now shade the hive, and let it stand until they all enter, then carry to the stand; but the proper and better way is to take the wing and gently wing them all into the hive, and as soon as possible close up the bottom board (if they are not quite all in, no matter), remove your hive at once to the stand, and keep it shaded the remainder of the day. If the bees cluster high up, fasten your dish to a pole, and hold it up to the bees; then with another pole, jar the limb suddenly, lower your dish and empty them down as before. If fearful of being stung, put on a bee-protector and gloves; then there is no danger, and you need be in no hurry. Always move steadily and quietly among bees. The whole time of hiving should not occupy over fifteen or twenty minutes. The sooner the bees are removed to the stand the better; always remembering to keep them shaded. Follow the above simple rules, and I guarantee you will not lose one swarm in fifty.

Hiving Another Way.

If you are present when a swarm issues, take a stick of convenient length, on one end of which is fastened a bunch of cloth. As soon as the bees commence to cluster, with this stick gently brush them off, and hold the bunch of cloth at the same place, and they will cluster on it; and may then be shaken off on the table as before. Mr. G. H. Bowerman, of Bloomfield, Prince Edward Co., has adopted this method, and is much pleased with it.

Swarms Leaving for the Woods.

If you perceive a swarm is leaving for the woods, leave the blowing of horns, rattling of bells, throwing of dirt, &c., to the boys and girls, while you act the more sensible part by throwing off coat and vest and trying your speed with that of the bees. If they should not go a long distance, you will be likely to discover their retreat.

Swarms Seldom Leave Without Clustering.

If there are any trees or bushes convenient to your apiary, (which there should be), swarms will seldom leave without clustering; and if properly hived in a good clean hive, are almost certain to stay, unless some tree has been previously found in which there is old comb; in that case, they are quite likely to leave unless prevented.

A Swarm Will Remain Clustered

From one to six hours, according to circumstances. If the sun is shining hot upon them, they may not remain over an hour, but if shaded, they will often remain six hours, and even longer. When a swarm has clustered where the sun is shining on it, if you are not ready to hive it, shade it and sprinkle it with water.

How to Prevent Swarms Leaving after Hiving.

In some cases swarms will repeatedly leave the hive and cluster, and at last go to the woods. In such a case when the swarm has been hived the second time, or when from any cause you are inclined to think that a swarm will not stay in the hive, set the guage of my hives so that workers only can pass in and out. The queen not being able to escape, the bees will stay with her. In a day or two the full entrance may be given them again.

To Prevent Swarms Issuing Together.

If there are indications that two or more swarms will come off together, or so near each other as to be likely to cluster together, which they frequently do, it may be prevented by sprinkling all stocks but one with cold water. Though but few bees are to be seen about the hives, sprinkle them and the hives well; it will keep them back for half an hour, by which time the swarm that has issued will be disposed of, and you will be ready for another.

How to Manage when Swarms Cluster Together.

When two first swarms cluster together, it is better by all means to separate them; for each swarm, when separated, will make nearly as much honey as both, if left together. There are several ways of managing when a case occurs. I will give the method which I consider the best As in a case of hiving, bring out a table: in this operation you will require a white cloth that you may the more easily see the queen, as the bees run over it. Spread the cloth on the table; turn over upon the table a common box-hive, or any other convenient box, raising one side an inch or more; now shake down the bees out of your hiving-dish upon the table about two feet from the box, wing a few of them towards the entrance, they will soon commence to enter; keep a good look out for the queens, if possible, capture both of them. They will be seen quite easily as they run over the white cloth. If the queens are captured, as soon as the bees have all gone into the box, proceed at once to place your hives on the table, side by side, with the bottom boards dropped down the same as for hiving; then, take a board six or eight inches wide and two or three feet long, set it up edgeways, one end between the hives running out in front, now shake the bees out of the box, half on one side of the board and half on the other side. You can now equally divide the bees by winging them from one side of the board to the other as you like. As they are running into the hives put the queens with them and they are all right. But if only one queen was captured, she must be retained and the hives must be separated as soon as the bees have entered. You must now wait fifteen or twenty minutes in order to ascertain which hive the other queen is in, which may be known by the bees appearing quiet and contented; while from the other hive they will come out and run around in great confusion, making a mournful noise and running over the hive as if seeking for something, and even starting off for the other hive, if it is near. As soon as this is seen you can give them the queen and remove the hives to their stands. If she is not captured the first time, the same operations must be repeated, and so keep doing until you succeed in capturing her. If *second* swarms cluster together, hive them together and let them remain so, as they will do better than if separated; one of the queens will be destroyed by the other or crawl out of the hive. With a bee-protector and gloves, *any person* may perform the above operation without fear of being stung.

How to Put Swarms Together.

There is not half the difficulty attending the putting of swarms together as is generally supposed. I have put swarms together all seasons of the year, except winter, and at all times of the day, frequently without smoking, sprinkling or scenting, and not over one in twenty has fought to any extent. If strange cattle are put together they will sometimes fight to each others' damage, and then again they will not fight at all. It is the same with bees. Yet I would recommend smoking as a general thing, and sprinkling with sweetened water, scented with any kind of essence, at least would do no harm, as bees are more likely to unite peaceably when all of one scent.

To Put Swarms Together in the Spring.

Spring stocks that are queenless or reduced in numbers, may be put together any time before they have commenced to gather pollen or honey to any great extent, without smoking or sprinkling, by simply winging the bees off the combs of one stock on to the top of the frames of another stock. They will soon run down among the combs all right. If each stock has a queen, one should be taken away.

To Put Swarms Together in the Summer.

Swarms that are cast the same day, although from different stocks, may be hived together, two or more, and they will be all right. Any swarms that have not been hived over thirty six hours may be joined together, by setting one hive on the swarming table in the same manner as for hiving, then shake the bees out of the other hive on the table, and let them run together. Capture the queen if convenient, if not, no matter, she will either be destroyed or crawl out of the hive.

To Return Swarms to the Parent Stock.

When third and fourth swarms are to be returned to the parent stock, it should be examined and all the queen-cells cut out except one; put the frames again in their place and set the stock on the swarming-table, drop the bottom board of my hive as in hiving, and shake out the bees you wish to return, on the table; as soon as they have entered remove the stock again to its stand. There is no more smoke required in the above operations of joining stocks than there would be at any other time of operating. (See how to operate with a swarm of bees.)

To Put Swarms Together in the Fall.

When late swarms are to be joined together, or when a swarm that has lost a queen is to be given to another, proceed thus :—Remove the stocks from their stands and smoke a little, then take the frames out of one hive, find the queen, and remove her,—if the other stock has one, then return the frames again and smoke both stocks well, or until the bees are stupid ; now put the bees of one stock on top of the frames of the other stock, no matter, how so long as you do it: wing them on, shake them on, or any way to get them on ; as soon as they have got down among the combs, put on the honey board and cover as before, and nineteen times out of twenty they are all right. It should be done, however, between sun-set and dark, or just in time to get through before dark. Let no one attempt to operate with their bees after dark, as they may be badly stung by bees running up under their clothes, which they will always do after dark. But a still better plan, which will answer for all seasons of the year, may be done at any hour of the day, and will never fail, is to drive both swarms out their hives into a box together, according to the directions given under the head "Bees—How to Drive." Then they may be returned into either of the hives from which they were driven or put into any other hive. If convenient, capture one of the queens when driving.

To Prevent Swarms Going in with One already Hived.

It sometimes happens that a swarm issuing directly after one has been hived, will at once go into the same hive and take up their abode with them. This may always be prevented by throwing over such hive a sheet, or cloth of some kind, at the time when other swarms are likely to issue.

Why do Bees Refuse to Swarm?

It would take too much space to enumerate all the causes why bees do not swarm; and since the introduction of moveable comb hives, it makes no difference whether they choose to swarm or not. The apiarian has control of that matter, and can double his stock or more if he desires it, by artificial swarming, (which see.) A scarcity of honey ; sudden changes in the weather ; a defective queen which cannot leave the hive ; stocks becoming reduced in the winter, are some of the causes why bees do not swarm. Old dark comb filled up with bee-bread, and which has become unfit for breeding in, the cells having become so small that nearly as many bees die as are reared, is frequently a cause in old stocks, which may be easily remedied in moveable-comb hives, by

Renewing of the Combs.

Old and worthless combs may be easily renewed with my hive by taking out a frame or two in the spring, and putting in empty frames in which the bees will build new comb, then others may be removed and so continued to do until all the combs are renewed.

How to Drive Bees.

It is often necessary to drive bees from old box hives, and by many it is thought to be a difficult task. Such, however, is not the case: almost any person can do it without difficulty. When it is desirable to drive a colony, take a dish of smoking chips, or my fumigator, and go to the stock you wish to drive,—blow a little smoke in at the entrance, give a few raps on the hive; the bees, thinking they are to be ejected (and they think right this time), rush to the cells and fill themselves with honey. Now take up the hive and carry it five or six rods from the stand; blow under it some more smoke, and then turn it over bottom side upwards: now take another old hive or box of convenient size, and turn it over on the hive; if it fits, all right, if not lay on some chips, shingles, weeds, or anything else that will stop the holes somewhat; then with a stick rap on the hive, if the bees make their appearance at the holes or cracks, blow a little smoke on them; continue the rapping for twenty minutes or half an hour at most, and the work is done. Now lift off the box carefully, and set where you please, or do what you like with the bees, the same as if they were a swarm just issued. It is always well to put some old box on the stand where the hive stood, while you are operating, as a decoy hive around which the bees will fly that come in from the field, and so keep them from going into other hives. Have no fears of getting stung by those bees you are driving, but look out for those bees that hang around the decoy hive, or that are straggling about to find the disturber of their domicile.

How to Transfer Bees from Box to Moveable Comb Hives.

This is often desirable and very necessary. Combs which are becoming unfit for breeding, if transferred, can be renewed (see renewing of combs); but if the combs are crooked in a hive, do not attempt to transfer them. The bees, however, may be driven and put into a new hive the same as a swarm; but if the combs are straight, proceed thus: drive the bees according to directions given under that head; then take off the side of the hive next to the side of the comb; cut out the comb, lay it on a table or wide board, then take a frame and lay on it, mark out the size of the frame, if the card of comb is large enough, if not, mark out a piece to fit as well as you can; fasten it in with pins put through the sides of the frame, let them run into the comb far enough to hold it in its place until the bees fasten it, which they will generally do in twenty-four hours, after which the pins may be removed. The good brood comb should always be put in the centre of the hive, and all store comb on the outside; the holes through the side pieces of the frame, for the pins may be made with a small bit or gimlet. Spare pieces of comb filled with honey may be put in the honey box.

Time when to Transfer.

It is generally considered that eighteen or twenty days after a *first* swarm has issued is the best time to transfer, for at that time there is little or no brood in the cells. On that account it is better; but in this northern latitude, and especially in sections of the country where buckwheat is not grown, where there is no fall honey harvest, it is too late unless there is an abundance of honey in the hive, so that sufficient for winter can be given them, for they are very apt to do but little except repair their comb, commencing at once to consume the supply on hand; but if there is sufficient honey they may be transferred much later, giving them all the honey by putting it in the honey box and placing it on the hive, they will soon carry it below. In order to be safe, however, where no fall honey harvest abounds, it would be better to transfer about s[illegible] season; then if the stock is strong, it may be divided and [illegible] into two good swarms, giving one the queen, and the other [illegible] comb on which are queen cells, which may generally be found about this time. Great care should be taken not to injure the brood.

How to Manage Bees in my Hive.

The management of bees in my hive will, in part, apply to all moveable comb hives; but as my hive has several advantages over other moveable comb hives, I will give the plan of operating for all general purposes. For the "preparation of the hive" and manner of "hiving," see directions under their respective heads.

How to Take Out Comb Frames.

Take off the cover, then at the back side of the hive pry up the honey board a little, and blow in smoke until the bees run down into the combs. Be sure and not disturb the honey box, but let it remain on the honey board ; if bees are in it, no matter. As soon as the bees have nearly all run off from the honey board, lift it off carefully with the honey box on it, and lay it down so as not to kill the bees, if any are still on the underside of the honey board. Now turn down the revolving bands, blowing a little smoke upon the bees occasionally to keep them down, or sprinkling with sweetened water. Now, stand close up to the side of the hive, and take hold of the ends of the *third* frame from the side of the hive farthest from you, and raise it out of the bearings and move it towards you as far as you can, without hurting the bees, say one-eighth of an inch, and let it rest there. Then take hold of the second frame and move the same way as far as you can. You can now take hold of the first frame, the *outside* one, and remove it without crushing the bees. After having examined it for whatever you may desire, you can hang it in a box or empty hive, or set it down and let it rest against the side of the hive, or what is still better, is to put two pins of hardwood in the side of the hive the right distance apart on which to hang the frame, and hang it on them. The other frames may then be taken out, examined, and hung on the pins, or placed back again in their respective bearings, except the second and third frames, which leave in the same position as they were when you took out the first or outside one, until you have placed *it* back again ; then place the second or third frames in their bearings again. If any bees are under the ends of the frames, blow smoke upon them until they run into the hive ; then turn up the revolving bands, and you are ready to place on the honey board, which do by commencing at the back of the hive, and slide it on gently. Any bees that are on the bearings, or on the honey board, will be pushed off without killing them. Whenever the bees get in the way, blow a little smoke on them and they will soon leave.

Artificial Swarming.

Artificial swarming, successfully practiced, has many advantages over natural swarming. By artificial swarming the apiarian is enabled to control his bees ; make many or a few swarms, just as he may desire ; prevent the issuing of second, third or fourth swarms ; keep all stocks strong and in a healthy condition. Many times when bees are allowed to swarm naturally, they refuse to do so altogether. All such stocks may be forced or divided, and made into two or more swarms, when artificial swarming is practiced. There is no loss by swarms going to the woods, nor loss of time in watching the bees during the swarming season, for at the proper time the apiarian can divide his stocks, and the work is finished.

Time when to make Artificial Swarms.

Any time after the drones appear, if stocks are strong, will do, yet I consider it better to wait until about swarming season.

How to make Artificial Swarms.

There are various ways of artificial swarming; some practice one method, some another. I will, however, give that which I consider the most simple, and requiring the least trouble. When the time has arrived to make your swarms, take from the stock you wish to divide two frames, from or near the centre of the hive, and put them in the centre of your new or empty hive, with all the bees that may adhere to them; examine them and see if the queen is on them, if not, she must be found and put on them; then take out two other frames, and shake or wing off the bees into the new hive with those already put in, but return the frames to the hive from whence you took them, and put in two empty frames in the place of those removed, in such a manner that a card of comb may be between them. Now remove the old stock from its stand some eight or ten rods, or more, if convenient, to a new stand; smoke them a little, and rap on the hive until they fill themselves with honey, and then leave them. Now take your new hive, in which you have just put two combs, with queen and bees, and set it on the old stand. The result will be that all the bees that were in the field, and some from the old stock, will return to the old stand and enter the new hive, which, having a laying queen, will soon build up and become a strong stock. The old hive will, of course, lose some bees by their returning to the old stand, but, at the same time, large numbers are being daily developed from the brood left in the hive, which will replace them. Finding their queen is missing, they will at once commence to raise another, unless they already have young queens developing, which they generally have about this time, in which case they will wait for one to develop. It is therefore better, if there are queen cells capped over, or with *larvæ* in them, to leave them in the old stock, then they will not be so long without a queen as they would if they had to produce one from the egg. If one of the stocks, after a day or two, has more bees than the other, you can exchange them, putting the weak stock in place of the strong one for a few days, until equalized. Another method: When the apiarian has eight stocks from which he wishes to make artificial swarms a frame may be taken from each (putting in empty ones in the place of those removed), wing off the bees into their respective stocks, and put the frames, containing comb and brood in all stages, into an empty hive; if queen cells are found in any of the stocks, give to the new stock a card of comb containing one. Now remove one of the strongest stocks away from its stand to a new one, and set the new stock in its place: enough bees from the old stock will return to the old stand and enter the new hive, to rear the brood, and make a strong stock. This may be repeated as often as the old hive can spare a frame. Both of these operations should be performed in the morning, on a warm day.

How to Prevent Swarming.

About five days after a *first* swarm has issued remove the comb frames and cut out all the queen cells but one, leaving the one nearly matured, which may be known by its having the wax removed from the end or lid by the bees, which gives it a brown appearance They may frequently be prevented from swarming by giving them more room in the body of the hive, which may be done by removing comb-frames filled with honey, and giving them empty ones. But when the former method is adopted and the queen cells destroyed whenever they attempt to build them, large amounts of pure surplus honey may be obtained.

How to find the Queen.

Whenever it is desirable to find the queen, follow the directions given for taking out comb-frames. Examine each card of comb separately, on both sides. If the queen is not found on the first comb examined. set it down outside, or hang it on pins fixed in the side of the hive, and so continue to do with each card of comb until the queen is found. No great difficulty need be anticipated in finding her, as she is always moving about and readily detected by her extreme length and tapering abdomen.

How to give a Queen to a Stock.

Whenever a stock is found to be queenless with no queen cells in the combs, a queen may be given to them without any danger of her being killed. Remove the cover off my hive, take off the honey-box, and put the queen on the top of the comb-frames, in the passage through the honey-board. It is always well to put a few drops of honey on her before you let her go. They will soon clean it off and receive her all right. But when a queen is to be given to a stock from which one has been removed, a little more caution may be necessary in introducing the stranger queen, especially if it be an Italian queen. (See the directions for introducing Italian queens.) There is not that risk attending the introduction of a queen as is generally supposed, especially if it be a laying queen; for as soon as caught by the bees she will at once drop her eggs, which seems to pacify them, and they will generally let her go. A young queen that had not commenced to lay might not fare as well, and laying queens are sometimes destroyed by the workers, but such is the exception and not the rule.

How to give a Queen Cell to a Stock.

This may frequently be done by exchanging cards of comb with a stock that has a queen cell to spare, or you may cut out a queen cell and insert in the combs of the queenless hive. This may be done by cutting out a piece of the comb on which the cell is built, then cut a piece the same size out of a comb from the queenless hive, and insert the piece containing the queen cell in its stead. Care must be taken not to bruise the queen cell.

How to give Worker Eggs to a Stock.

When a stock is found queenless, and no queen or queen cells can be spared to give it, you can remove a frame and exchange it with a hive that has brood comb with worker eggs in it, or a piece of comb may be cut out and inserted the same as a queen cell.

How to know when a Stock has no Queen.

Take out the combs and examine them; if there are no eggs nor brood, you may be quite certain they have no queen. In common hives, during the breeding season, if there is a queen, eggs may be found on the bottom board in the morning. If a large number of drones are allowed to remain in a hive long after they have been destroyed by the bees in other hives, you may be certain that such a hive is queenless.

How to Tell a Drone-laying Queen.

Queens frequently become unfertile the fourth year of their age, and lay drone eggs. When such is the case the bees diminish in numbers, until too few are left to protect the combs from the moth, while the drones grow even more abundant. When it is suspected that a stock has a drone-laying queen, it may be easily ascertained by examining the combs. If the worker cells contain drone brood you may be quite certain that you have a drone-laying queen. If drone brood is in the worker cells, it will be known by such cells projecting beyond the usual even surface of worker brood, and being very irregular, here and there a few.

How to tell when a Swarm has a Drone-laying Worker.

As in the case of a drone-laying queen, the brood will be irregular and some in drone cells and some in worker cells, and yet it will be all drone brood. If, upon examination, no queen is found, you can rest assured there exists a drone-laying worker. *Remedy:* Introduce a queen, queen cell, or worker eggs.

How to put Honey-boxes on my Hive.

Remove the cover, if the passage through the honey-board has been covered with a board, pry it up gently, blow under a little smoke, then take it off, blow more smoke, until all the bees run down among the combs, then put on the honey-box. If the honey-box has been turned over, bottom side up, pry up as before, blow a little smoke, and turn it over.

How to Remove a Honey-Box from my Hive.

Take off the cover, pry up the honey-box, gently blow under some smoke until the bees run down among the combs, then take it off and put on another, or cover with a board. This is much better than sliding on a piece of sheet-iron, killing a number of bees. Honey-boxes should be removed in the morning, early, as less bees are in the boxes at that time.

How to Get Bees Out of a Honey-Box.

If they are removed in the honey season, there is but little difficulty; blow in a little smoke, turn the box over a short distance from the hive, give it a few raps and they will soon leave. If removed in the fall, when the honey harvest is done, or nearly so, it is better to set your honey-boxes in a barrel or box and cover it with a white cloth; the bees will soon leave the honey-boxes and light upon the cloth, which may be removed and the bees shaken off. By this method the bees will be prevented from removing the honey to the hive, which they are very ready to do in the fall.

Why Boxes should not be Put on at the Time of Hiving.

If bees are allowed to go into the honey-box at the time of hiving, they will commence there to build comb, and the queen being with them, they will build brood-comb and make it their home instead of the body of the hive, which would ruin the stocks.

Ventilation.

There is much written and said about ventilation, some advocating an upward ventilation or hives ventilated at the top, and some an under ventilation or hives ventilated at the bottom. Now the truth is, the advocates of both these systems are partly right and partly wrong. An upward ventilation is quite correct for winter, in order to carry off the vapour that arises from the bees, and keeps the bees and comb dry, and prevents the collection of frost among the combs; while during the summer when stocks are breeding, it is quite wrong; for there are often cold nights and sudden changes when a current of air passing upward through the combs would greatly retard the rearing of brood, while an under ventilation, that is, a current of air passing through under the combs would, in no way, affect the brood, and yet be sufficient for the bees.

Ventilation in Summer with my Hive.

When the bees are too warm and require more ventilation, there will be an unusual roaring in the hive, and a number of bees about the entrance, blowing with their wings; the roaring in the hive is also caused by bees blowing inside. More ventilation may be given them with my hive in a moment's time by simply turning the buttons at the rear of the hive so that the bottom board may drop down half an inch. The bees that were blowing will at once go to work, and the roaring cease. It would be better to close it up again at dusk to prevent millers going in.

Ventilation in Winter with my Hive.

If wintered in a house, as recommended in this work, or dry cellar, or any other place where it will not freeze, the *honey-board* should be removed, and a piece of wire-cloth, stiff-net, or cheese-cloth, laid over the frames in its stead; or what is still better, make a narrow frame the size of the honey-board and tack on a piece of wire-cloth and keep it for winter use. The hive thus prepared, the cover being placed on as usual and the entrance closed, they will have a ventilation that cannot be surpassed for wintering in-doors where it cannot freeze. When stocks are to be wintered out of doors, proceed as follows:—Remove the honey-board and put on the wire-cloth or stiff net the same as for wintering in a house, then lay on as much clean straw, or hay, or what is better still, corn-cobs, as the cover of the hive will shut over; see that it shuts tight; close the ventilation through the bottom board, by covering the passage with a piece of tin or sheet-iron; contract the entrance to half an inch or close it entirely if you think best, and your bees are prepared and properly ventilated for wintering out of doors.

Description of the Bee-Moth or Miller.

Among all the enemies of the honey-bee there are none that require any consideration except the moth or miller. Let it be understood that the moth and the miller are one and the same thing, laying quiet and stupid looking during the day, about the apiary and around the hives, but as soon as the grey dusk of evening approaches they begin to sally forth, if possible, to enter the hive and deposit their eggs among the combs, where the heat of the bees soon developes them into what are called "grubs," "miller-grubs," "worms," "moth-morms," &c., all being the one and same thing—the *larva* or grub, developed from the egg of the moth or miller, after a similar manner that the honey-bee *larva*, worm or grub is developed from the egg of the queen bee. The bee grub spins itself a cocoon in the cell, and finally comes out a winged insect—the *honey-bee*. So the miller-grub spins itself a cocoon in some place of concealment, and finally comes out a winged insect—the *miller* or *moth*. The *bee*-grub is fed in the cells by the workers, but the *miller* grub is obliged to help itself, which it does as soon as it is hatched, its principal food being wax and comb, on which it feeds voraciously for about three weeks. It then spins its cocoon from which it frequently comes out a miller in ten or twelve days; sometimes, however, remaining for months, and even all winter, without being transformed; much depending, as to the time of transformation, upon the degree of heat to which they are subjected. If the miller cannot deposit her eggs on the combs in the hive, she will deposit them in a crack or any other place where they will get sufficient heat to hatch them: the grubs then crawl in and commence to feed on the combs, and, if not disturbed, they will sometimes grow to an enormous size before spinning their cocoons; at other times they spin their cocoons when quite small. In a strong stock they seldom do much damage, being caught by some worker-bee by the nape of the neck, and very unceremoniously ejected.

Description of a Moth or Miller Nest.

A moth or miller nest is formed by the grubs getting the advantage of the bees and spinning their cocoons in the combs; the stock being weak, they are not dislodged; the consequence is, the heat of the bees soon transforms the grub into a miller, which, emerging from the cocoon, is already in the combs and soon commences to lay her eggs, which soon hatch into other grubs, which again in turn spin cocoons and emerge millers. Thus the nest which at first was not larger than a walnut, gradually increases in size as more eggs are laid, more grubs are hatched, and more millers produced, until it becomes as large as a quart bowl, and sometimes even larger, till at last the stock is entirely destroyed.

How to Know when a Miller Nest is in the Combs.

If a miller's nest is in the combs, it may readily be seen by removing the frames and examining the combs. It resembles a worm nest, like those seen on apple trees. It may also be known without removing the frames, by dropping the bottom board of my hive. If a nest is formed in the combs, the fæces or excrements of the grubs, resembling coarse powder or ground coffee, will be seen on the bottom board, directly under where it is located; also chippings of the comb and immature bees, often webbed together, which the bees have dislodged in their endeavours to cut out the nest. These signs may also be seen on the bottom boards of common hives by turning up the hive; but having no control of the bees and comb, the difficulty is to remove the nest and save the swarm; but in moveable comb hives this difficulty is entirely obviated.

How to Destroy or Cut Out a Miller Nest.

Drop the bottom board of my hive, and by the signs given above, see in which card of comb the nest is located, then remove the comb from the hive, wing off the bees, or blow a puff of smoke on them and they will run to other parts of the comb, leaving the nest bare; then with a sharp knife cut out the nest; search out any grubs that may have run out into the combs to eat, and remove them, for they run out in every direction directly over the heads of the brood, spinning around themselves a silken case, called "a worm gallery," through which the bees cannot sting, and in which they can move backwards or forwards to or from the nest as they see fit, the head only protruding beyond the case when it desires to eat. Now, it will readily be seen that by the use of moveable comb hives, this most destructive of all enemies of the honey-bee is easily disposed of. Ten minutes' time, a puff of smoke and a pocket-knife will remove the nest and save a stock of bees.

How to Destroy Miller Grubs.

Every morning, or at least two or three times a week, drop down the bottom board of my hive and despatch all that can be found, for the bees frequently eject them from the combs, and they fall to the bottom board, where they may be easily destroyed if attended to before they crawl out of the hive and wind themselves in their cocoon for transformation. With a very little trouble a trap may be made and nearly all of them caught. Take a strip of board about eleven inches long, five inches wide, and one-fourth of an inch thick, cut little grooves in it on one side, but not large enough to allow the bees to enter; place this in the hive on the bottom board with the grooves downwards; the grubs seeing the grooves will crawl in, it being a safe retreat from the bees, where they can spin their cocoons. Remove this two or three times a week and destroy them. This should be attended to, or it will prove a damage, for every grub that is not destroyed will become a miller and lay thousands of eggs.

How to Destroy the Miller or Moth.

Always be on the look-out for them when about the apiary. Let none escape. Remember they are like the Irishman's flea—" when you put your finger on him he is not there." Many may be caught by mixing with water just enough molasses and vinegar to make it palatable, put into white dishes and set among the hives at night. In the morning some will be found drowned, and others too drunk to " paddle their own canoe." This may be used until dried up, adding a little water occasionally. Milk set out in dishes among the hives will also catch many of them. Let it be remembered, however, that the best remedy of all is, *keep strong stocks*.

Feeding Bees—Will it Pay?

Says Quinby: " Feeding bees in the spring is sometimes absolutely necessary; but in ordinary seasons and circumstances, it is somewhat doubtful if it is the surest road to success, for the apiarian to attempt wintering any stock so poorly supplied with honey that he feels satisfied will need feeding in the spring or before." I think Mr. Quinby not far from the mark. It is certainly far better not to put any stocks into winter quarters that will require feeding. If it is desirable to winter a stock that is deficient in honey, let it be fed in September until the hive contains enough to carry them through the winter. Under some circumstances, it may be necessary to feed in the winter and in the spring, and when such is the case, it can be easily done in my hive.

How to Feed Bees in the Spring in my Hive.

Remove the cover, and place a dish containing feed on the top of the comb frames in the passage through the honey board, replacing the cover as before. At this season of the year they may be fed any kind of sugar made into a syrup with water. A piece of comb is very convenient to put into the dish, and then turn the feed on to it. If comb cannot be had, some straws or sticks should be put into the dish to prevent the bees from getting into the feed. Half a teacupful every morning will be sufficient for a strong stock.

How to Feed Bees in the Fall.

Bees, in the fall, may be fed after the same manner as directed for the spring. It is better, however, to feed white sugar or honey, but common sugar will do. If honey is fed in the comb a piece may be laid in the dish until the honey is taken out, and then removed, and more put in. Liquid or strained honey should be fed the same as syrup. If candied honey is fed, water must be put to it, and then bring to a boil, skim and let it cool.

How to Feed Bees in the Winter.

Bees that are to be fed in the winter should by all means be wintered in some place where it cannot freeze; then the manner of feeding will not vary much from spring or summer. A dish containing the feed should be placed on the top of the comb frames and constantly supplied with feed. A coarse linen cloth—cheese-cloth is best—should be spread over the whole in such a manner as not to prevent the bees reaching their feed, and the cover of the hive put on. The cloth will allow the vapour to pass off and at the same time retain sufficient heat to keep the bees warm and allow them to reach their feed. If wintered out of doors, they may be brought into a room where it is warm, and fed, say a quart of feed, and then removed to their stand again. This must be repeated every few days. Feed for winter should always be honey or white sugar, prepared according to directions given under the head " Bee Feed," or a few pounds of candy, commonly called " sugar sticks," may be laid on the frames, and if wintered in a proper place, they will come up and eat whenever they require it.

Drones Should they be Destroyed?

As drones are of no use only to impregnate the young queens, it is evident that any more than is absolutely necessary for that purpose are worse than useless, as they every day consume a large amount of honey. One hive containing drones out of every twenty-five is quite sufficient; all others may be destroyed as soon as they appear, or prevented from appearing by cutting out drone comb. When the swarming season is over the remainder may be destroyed. By this method not only a large amount of honey is saved, but the bees are saved the time and the trouble of killing them.

How to Cut Out Drone-Comb.

Remove the frames from the hive, and with a sharp pocket-knife cut out all that portion of comb containing drone cells; and if you have good brood comb to spare, you may fit in a piece in the place of that removed. It is best to cut a little into the worker comb, as the bees in replacing the piece removed will be more likely to build worker cells if they have worker cells to commence with.

How to Destroy Drones.

If the drones are allowed to develop, they may be shut out of my hive and destroyed by closing up the bottom board or setting the guage so that they cannot get in. This should be done about two o'clock, p.m., when they are principally out of the hive. About sunset large numbers will be clustered on the outside of the hive, and may be brushed off and destroyed,—no matter how you do it, so that you make sure and quick work of it. This may appear cruel, but it is much less so than to allow the workers to slowly torture them to death.

Robbing of Bees.

Spring and fall, or before the honey season commences, and after it closes, bees are much inclined to rob each other; and, sometimes, for want of a little attention, cause the apiarian much trouble and loss. It frequently happens that a stock of bees becoming overpowered by robbers, join in with them and assist in carrying away all their stores, and the bee-keeper very unexpectedly finds his hive minus bees and honey.

How to Know when Bees are Robbing.

As soon as bees commence to rob there may be seen on the lighting board several bees surrounded by others, forming small clusters. The bee surrounded is a robber; they hold it a prisoner; some are biting its legs, some its wings, while another is ready to take what honey it has, for by the continual biting of the other bees it is forced to give it up. When it has given up all the honey it is sometimes allowed to go free, but frequently it is at once despatched by a sting, and in its effort to save itself from the deadly thrust falls upon the ground to rise no more. When this is seen, robbing has commenced, and the stock should be at once attended to. A strong stock will generally defend itself, but if weak it will very likely be overpowered, unless some assistance is rendered.

How to Prevent Robbing, with my Hive.

When proper attention has been given to the bees, and the directions followed which are given for spring and fall management, there will be but little to fear from robbing. But if this has been neglected and robbing commences, the guage should at once be set so that only one or two bees can enter at a time, and then keep a good look out that the passage does not become closed up by the robber bees that are killed in trying to enter. If this does not stop the robbing in a short time, the passage should be closed at dark, shutting in the bees; give them some water and keep them in for a day or two until the robbers seek other quarters.

How to know whether the Robbers are your own or Neighbours' Bees.

This may be easily ascertained by sprinkling flour upon them as they leave, then watch your other stocks and see if they enter, or the flour may be sprinkled upon the bees of the other stocks, then watch the stock that is being robbed and see if they enter.

The Best Method of Wintering Bees.

The success of the Canadian bee-keeper depends as much, perhaps more, upon adopting a right method of wintering his bees as any one thing. It is evident that if stocks are properly wintered, they will come out stronger and be far more likely to cast early swarms, True, bees have been wintered out of doors, subjected to great exposure, and did well. The same may also be said of cattle; but who will say that cattle well stabled would not do better? May not the same be said of bees? Many plans have been adopted by different bee-keepers, which, if rightly considered, are but modifications of two methods—wintering where it will freeze, as out of doors, in an out-house, wood-shed, &c.—and wintering where it will not freeze, as buried in the ground, in a dry cellar, dark room or house made for the purpose. Those who have wintered in a warm place have generally met with the best success; though oft times the place in which the bees are put is objectionable, on account of the bees being too often disturbed, or its being too warm, or the temperature being uneven. I will, therefore, give a plan of a bee-house in which bees may be wintered safely, being free from all of the above objections.

Bee-house for Wintering Bees—How Made.

A bee-house should be built somewhat in proportion to the number of the stocks to be put into it. It should have a double wall, with a space of six or eight inches between them, which should be filled with straw, dry tan-bark, or sawdust. It should be lathed and plastered inside. The floor should be double, and at least six inches from the ground, with a small hole in the centre for ventilation when necessary. The door should be double, like the wall, and shut tight to admit no light, for the house should be as dark as it can be made. It should also be filled overhead between the roof and the ceiling, with dry straw. There should be for every five feet in length, one 2-inch tin pipe running through the roof, for ventilation. A house 5 feet wide, 10 feet long, and 6 feet high, will hold 30 of my hives, and leave room to pass between them for the purpose of examination, if necessary. It should be well banked with a 2-inch pipe passing through the banking to correspond with the hole in the floor. This pipe should be kept closed during the severe part of winter, allowing no current of air to pass in at the bottom of the house; but towards spring, when the weather becomes warmer, it should be opened. The two pipes passing through the roof should be left open during the whole winter. When stocks increase so as to require more room, another five or ten feet may be added to the end. If the stocks are less in number, a partition of boards can be put in, keeping the stocks all in one end. Should it be desirable to let the stocks stand in this during the summer, wooden spouts may be made to pass through the south side of the house, and fit to the entrance of the hive. These pipes or spouts should be closed in winter by little doors on the outside, which in summer may be turned down, forming lighting boards for the bees. It is better, however, to remove the stocks in the spring, and put them up again in the fall, Stocks placed in such a house, with plenty of honey and ventilated, according to directions given under that head, will require no attention during the winter, and will consume far less honey, and cast much earlier swarms than stocks wintered out of doors.

CHAPTER IV.

Spring and Summer Management.

Let it be understood that I speak of the management of bees in moveable-comb hives in general, but more especially in my own. (See chapter on "Hives" for description.) At the same time much will apply to the management of bees in common or box-hives, to which I shall occasionally refer. For full directions how to do what is required in each month, see chapter on "General Management."

March Management.

Much will depend upon the season. If snow is still on the ground and weather cold, but little can be done. If your bees are in a cellar, dark room, or house made on purpose for wintering, do not disturb them, if you are certain that they have plenty of honey, if not, examine them; if found wanting, feed them (see "Feeding Bees"); but if the weather is warm and snow gone, or nearly so there are several things that should be attended to. Set out all stocks wintered inside; examine each stock by lifting out the frames; clean out dead bees, if any are in the combs; cut out all comb that is mouldy to any great extent; if but slightly affected, let it remain; see if they have a queen; if not, give the bees to another stock. See if they have honey to carry them through, if not, feed them. Drop the bottom board at the rear of my hive, and clean out all dead bees and filth. Close up all upward ventilation, and set the patent guage so as to leave but half an inch entrance, to prevent robbing, and keep as much heat in the hive as possible; occasionally look to weak stocks and see that they are not robbed. If there is no water near which they can get, put some in a dish with some straws, or anything that will keep them from drowning, and place near the hive; they require it in preparing food for their brood; also set a dish of oatmeal, buckwheat, or rye flour, where they can get it. They will use it instead of *pollen* for bee-bread. Give your stocks all the warm sun you can. Visit them every day, if only for a moment, as you might observe something wrong and save a stock.

April Management.

When March is cold the management given for that month will apply to this. If not examined before, all stocks should now be attended to, and the directions given for March fully carried out. As they are now breeding quite extensively, much more honey is consumed than in the winter. See that all stocks are well supplied. Drop the bottom board of my hive and destroy the worms, if any. Turn all honey boxes over; bottom side upwards. Lay a piece of salt on the lighting board ; as bees seem to like it, let them have it.

May Management.

Various flowers begin to make their appearance the first of the month. About the middle of the month, fruit and other trees are in blossom, and in most localities, under favourable circumstances will yield honey enough for their use ; but in order to be safe, all stocks shold be watched until the clover makes its appearance. All moveable comb hives should now be examined and drone comb cut out, and the rearing of drones prevented. By this method the large amount of honey is saved which it takes to keep an unnecessary amount of drones. Hives should now be got ready for use, old hives should be scalded and prepared for the bees according to the directions given under the head "Preparation of Hives." As the honey harvest is increasing and robbers are reforming by gathering honey instead of robbing their neighbours, the guage on my hive may be set so as to allow the full entrance to the hive. The last of the month, if the honey harvest has been good, honey-boxes may be given to strong stocks. From very strong stocks, if the season has been favourable, swarms may issue the last of the month ; but such cases are very rare in most parts of Canada.

June Management.

The honey harvest may now be said to have fairly commenced. All surplus honey-boxes should now be put on or turned over; right side up, and all good bright pieces fastened into them, for it is worth far more to put into the honey-boxes than it is to melt into wax. Dip the edges of the comb into melted beeswax, and stick it fast to the box. Bees will enter boxes far more readily where there is comb. As soon as the bees have commenced to work in the honey-boxes, the front revolving band of my hive should be turned down, which will give the bees a short route to the honey-box, and enable them to deposit one-quarter more honey. New swarms may now be looked for, though of late years but few issue until after the fifteenth. A little more attention paid to the apiary in spring and the method of wintering adopted which is advocated in this book, and earlier swarms would be the result. When swarms issue, follow the directions given in the chapter on general management under the head of "Hiving." Put two second swarms together unless they come off early and are very large. Third and fourth swarms should always be returned to the parent stock. (See full directions under the head "How to Put Swarms Together.") If the apiarian doubles his swarms in Canada yearly, it is quite sufficient. Strong stocks and plenty of honey will ensure success. When bees are seen upon the lighting board blowing with their wings and an unnatural roaring in the hive, they are too warm; give more ventilation. With my hive you have only to drop the bottom board at the rear of the hive half an inch. It may be closed up again at dark.

July Management.

The management of this month will not vary much from the management for June. Double all late swarms or return to parent stock. Honey-boxes that are full should now be taken off. (For directions, see "How to Remove Honey-boxes.") All honey-boxes should be removed as soon as capped over, or nearly so, before the bees leave the box and go below, especially if it is the intention to put on another box, for they are far more likely to commence in another box if they had not finished their labours in the one that was removed. Frames may now be removed from strong stocks and empty ones given them. The outside frames should always be removed from the hive, as they contain the most honey and but little or no brood. An outside frame in my hive will frequently contain 10 lbs. of honey. They may be kept safe from the moth by hanging them in a dark cellar or in a tight box, and will be found very convenient to give to stocks that are deficient at the close of the honey harvest. The moth or miller and miller grub should now be watched with jealous care. Declare a war of extermination against them, and carry it on to their every day destruction. Every morning drop the bottom board of my hive and destroy all that can be found. If they form a nest in the combs, which may be known by the fæces of the grubs, somewhat resembling ground coffee, and the chippings of comb that have fallen down on the botton board, the frames must be removed and the nest cut out. (For full directions, see "Moth Nests—

How to Destroy.") See if all the stocks have a queen, which may be known by the presence of brood or eggs; if not, give them one, if you have one to spare; if not give them brood comb containing worker eggs. As soon as the swarming season is done, shut out the drones and destroy them. (See "Drones—How to Destroy.") If bees hang out on the hives of young or old swarms, they require more ventilation. Drop the bottom board of my hive half an inch; clo-e again at night.

August Management.

No particular attention is necessary this month, except to watch weak stocks and see that they are not robbed, and continue the war of extermination with the miller-grubs.

CHAPTER V.

Fall and Winter Management.

Success in bee-keeping depends much upon fall and winter management. Where only a few colonies are kept, not much time is required, especially with my hive. A short time each day during the rest from other labour is all that is necessary. Where a large number of stocks are kept, more time would be required to tend them, but it would be as profitably spent as in any other way. (For full directions how to do what is required in each month, see Chapter on General Management.)

September Management.

Remove all honey-boxes. All late or small swarms should now be put together according to the directions given under the head, "How to put Swarms together in the Fall," for one strong swarm is better than three weak ones. Examine all stocks and see if they have plenty of honey to carry them through the winter. About 30 lbs. is required to winter a strong stock safely. (See "How to Ascertain the Amount of Honey in a Hive.") If they have not that amount, now is the time to feed them—(see "How to Feed Bees in the Fall,")—in order to have them carry it below into the combs and seal it over while the weather is warm; or they may be supplied with a frame containing honey removed in July, if you have one, or give them a frame from some strong stock that can spare one. Remember if stocks are fed now until they have the above amount of honey in the hive, no further attention will be necessary only to put them into winter quarters until spring—

wintering all the better for not being disturbed. (See "Wintering Bees.") Set the patent guage to my hive so as to contract the entrance to one half inch. Keep a good look out for robbers. If stocks in common hives are to be taken up, now is the time to commence this wholesale destruction by committing them to the fumes of fire and brimstone, for they can add no more to their hard earned stores.

October Management.

If the requirements for September have been neglected, they should certainly be attended to this month, as far as the weather will permit. Keep a good look out for robbers.

November Management.

If the weather is very cold and snow has fallen, all stocks may be put into winter quarters, or prepared for wintering out of doors. If single boarded hives are used, it is decidedly the safest and most successful method to put all stocks into a dark, dry cellar, or dark room away from the fire, and yet so warm as not to freeze, or what is still better into a house built for the purpose. (See "Bee-house for Wintering Bees.") If stocks are to be wintered out of doors, my Double-boarded Self-protecting Hives should, by all means, be used. (See description.) All stocks should be examined and centre passages cut through each card of comb, if the bees have failed to do so, especially is they are so be wintered out of doors. By the use of my hives, two persons can examine forty or fifty stocks, cutting all the centre passages in an hour's time. If, however, this month is somewhat warm and pleasant, preparations for wintering may be postponed until December.

December Management.

If not before, preparations must now be made for winter. All stocks that are to be removed into winter quarters, should now be attended to, and all stocks to be wintered out of doors should be prepared by giving proper ventilation according to the directions under the head of "Wintering Bees." All those using my hives and having attended faithfully to all the directions given for wintering bees, need pay no more attention to their bees during the winter, except in cases where it is desirable to winter stocks that require feeding. I would, however, advise that no stocks be wintered that require feeding; though there is no difficulty in feeding, with my hives, yet it requires some care and attention, and as a general thing, is not profitable.

January Management.

Any stocks which you suspect will require feeding, should now be examined; if short of honey, feed them, according to directions given under the head, "Feeding Bees in Winter." Stocks that have sufficient honey should not be disturbed, for the less they are disturbed, the less they will eat, and the better they will winter. Mr. G. H. Bowerman, of Bloomfield, Prince Edward Co., C. W., has wisely adopted this plan. He puts his bees into a dark house made for the purpose, locks the door, and troubles them no more until the snows of winter are gone and they can work safely. He writes me this spring, 1865, that his bees have wintered well. All others who adopt the same method, following the directions given in this work, will be able to say the same. Mr. Bowerman has used the moveable-comb hives of the Langstroth pattern, improved by himself, for several years, and says, he would not think of keeping bees in any other than moveable-comb hives. He has now obtained one of my hives.

February Management.

The same as for January. Stocks that require feeding must be constantly attended to, while those which have plenty of honey need no attention if wintered in my hives; but if in box-hives, out of doors, care should be taken that the air passes at the bottom, or sides of the hives are kept open so that the bees will not smother. If the stock should become buried in the snow, let them remain, for they will winter safer than if exposed.

CHAPTER VI.

Hives.

In all ages the ingenuity and inventive powers of the bee-keeper have been taxed to bring forth a perfect hive; a hive adapted to the nature and habits of the bee, and at the same time so constructed as to give the bee keeper control of the bees. The result has been that almost an innumerable variety of hives have been brought forward; some entirely useless, others worse than useless, while *many* are but little better. In fact, until the idea of a moveable-comb hive was conceived, no essential advantage was gained over a common box-hive.

Moveable Comb-Hives—By Whom Invented.

It has generally been supposed that L. L. Langstroth was the inventor of moveable-comb hives. Such, however, is not the case. Mr Langstroth was the first to introduce them into America, and having improved them, obtained a patent for the United States. More than sixty years ago, a "leaf hive" was invented by Huber, which would open and shut like a door, but it had some serious objections. In 1844, W. Augustus Munn, published in London, a description of a moveable-comb hive invented by himself. At that time it was called a bar-and frame hive. He then used the oblong bar-frames, to take out of the back of the bee-box. In April, 1865, he published a second edition of his pamphlet, describing his "improved hive," with triangular bar frames, made to lift out of the top. He says, on p. 23: "*my object* has been to point out briefly to those anxious for the better, more extended and economical mode of bee management, the difficulties to be provided against, and to recommend to their consideration the advantages offered in the bar-frame hive." One year after the publishing of this pambhlet, on the 5th of October, 1852, Mr. Langstroth obtained a patent on "improvements in bee-hives," under which he is generallly understood to claim all moveable-frames in bee-hives. However, Mr. Langstroth says:—"I have before me a small pamphlet published in London, in 1851, describing the construction of the bar-and.frame hive of W. A. Munn, Esq., ... Great ingenuity is exhibited by the inventor of this very costly and very complicated hive, &c." See Honey-bee, 3rd edition, 1860, page 209.—Note. It appears then, that moveable comb hives were first invented in England; but that they were greatly improved by Mr. Langstroth, there can be no doubt. Says J. S. Harbison, in Bee Culture, p. 149: "The *Langstroth-hive*, like the Huber and Munn hives, is constructed on the moveable-comb principle; but more properly combines the oblong-bar-frame as originally used by Munn, with Beevan's bee-box and other additional improvements, making it more simple and practical than either of its predecessors." Mr. Langstroth has also published a compiled work on the honey-bee, a copy of which should grace the library of every apiarian in Canada.

What a Hive should be.

It is quite important that a hive should be of the right size and shape, and so constructed as to give the bee-keeper perfect control of the bee-comb, bees and brood, and at the same time allow him to obtain large quantities of surplus honey, without robbing the bees or consigning them to a pit of fire and brimstone. A moveable-comb hive, properly constructed, is the only hive that will do this. Of these there is quite a variety offered to the public, among which are the Quadruple, or Michigan Hive, Kidder Hive, Lee Hive, and Langstroth Hive; of this last there are more used in Canada than of either the others, of which also there are many modifications; nearly all, however, retaining the oblong frame, which, by many experienced apiarians, is considered a great objection to it, and on account of which the Lee Hive, patented in Wisconsin, has been awarded a premium for its superiority over it several times in the United States. A low and shallow hive does not allow the bees to carry their stores sufficiently far from the bottom board to escape the cold. Even Mr. Langstroth himself admits that " a hive *tall* in proportion to its other dimensions has some obvious advantages."—*Honey-bee*, pp. 329, 330. Says J. S. Harbison :—" Many eminent apiarians bear testimony to the superiority of deep hives over those that are low and shallow."

As before remarked, size is very important A hive containing much over 2,100 inches is quite too large, and anything under that, for Canada, is too small. Taking into consideration the extreme length of our Canadian winters, with my own experience, I have concluded that about 2,000 inches is not far from the mark, and in offering to the public another hive, for which I claim several important improvements over any moveable-comb hive with which I am acquainted, I have made it of this size.

The following cuts and description will give the reader a fair idea of my Single and Double-boarded Moveable-comb Hives, for which Letters Patent were granted to me on the 2nd day of May, 1864, and again on the 22nd of March, 1865 :—

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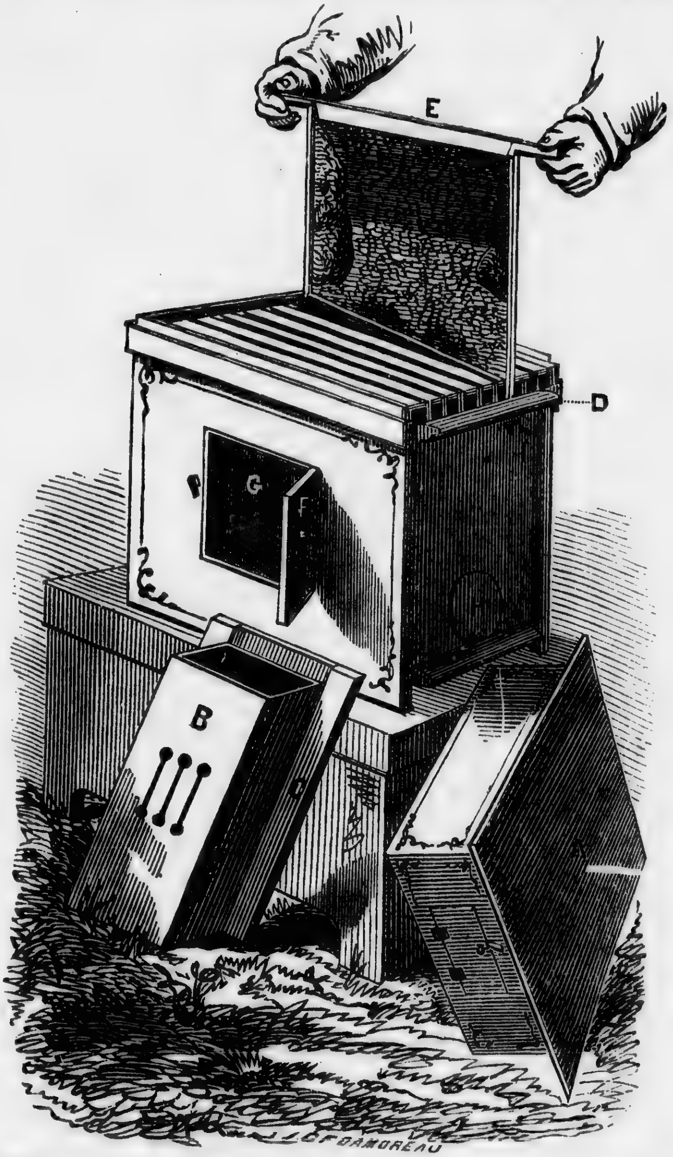
SINGLE-BOARDED OBSERVING HIVE.



A.—Removable cover. B.—Honey-box. C.—Honey-board. D.—Revolving-band. E.—Comb-frame, removed. F.—Observing-door. G.—Glass. H.—Robber-stop—metallic or tin gauge.

Description and Advantages of the Single-boarded Hive.

It is a Moveable-Comb Hive

Which gives the apiarian perfect control of the bees and comb, and enables him to practice artificial swarming, to renew the comb in the body of the hive, when it becomes old and worthless, to cut out drone comb and prevent the rearing of an unnecessary amount of drones, to cut out moth nests, and thus save a colony from destruction, to easily ascertain if a stock is queenless, and give it another without difficulty, to prevent swarming, when desirable, to build up weak stocks by exchanging with strong stocks empty cards of comb for those filled with brood and honey; in fact, it enables him to examine his bees at all times, know their true condition, and have the utmost control over them.

It is Tall in Proportion to its other Dimensions,

Which is the form best adapted to northern latitudes, "for," (says Mr. Langstroth, speaking of a *tall* hive), "as bees are disposed to carry their stores as far as possible from the entrance, they will fill its upper part with honey, using the lower part mainly for brood, thus escaping the danger of being caught in cold weather among empty ranges of comb, while they still have honey unconsumed."—*Honey-bee*, p. 330. It also allows the bees to form a natural cluster, which in shallow hives they cannot do, but are obliged to spread out, and hence are not able to keep up the same amount of heat they can in a tall hive.

It is the Best Ventilated Hive I have ever seen in Use.

The apiarian is able, without difficulty, to ventilate according to the season, and in a manner best calculated to promote the health and prosperity of the stock.

It cannot be Surpassed for the Production of Surplus Honey.

As soon as the bees commence to work in the honey-box, the front revolving-band may be turned down, giving to the bees a short route, which they will soon take advantage of, and deposit surplus honey much faster.

It has a Swinging and Adjustable Bottom Board,

Which enables the apiarian to clean the hive of all dead bees and filth; to destroy large numbers of the miller grubs; and to ascertain if the millers have formed a nest in the combs. There is also a passage through the bottom board covered with wire cloth, through which the bees receive air when it is necessary to shut them into the hive.

It has a Metallic Guage or Robber Stop,

Which allows the entrance to be contracted to any size desired, in a moment of time, by which robbing is prevented, drones shut out, the queen shut in, while the workers pass out and in at pleasure, or, if desired, they also may be shut in.

It Contains the Best Comb Frame in Use,

The top piece being constructed in such a manner as to cause the bees to build straight. This is an important feature in every moveable-comb hive. If the bees do not build straight, they are but little better than common hives. The top piece of my comb-frame is so constructed that it is almost impossible for the bees to build crooked. I do not think this can be said of any other top piece in use. It also has flat projecting ends, which the apiarian can take hold of to raise the frame out of the hive instead of taking hold of the frame among the bees.

It Contains a Hot Air Chamber,

Which allows the bees to pass freely over the top of the comb frames, causing them to work much more readily in the honey-box, as the bees in the box are not detached from the bees in the chamber; also by the heat of this chamber the honey-box is kept nearly as warm as the body of the hive. The honey-board over this chamber is so constructed that bees may be fed at any time without the least difficulty.

It has a Superior Comb Frame Bearing,

Being bevelled to a sharp edge, the bees cannot glue the comb frames fast, and no place is left for the grubs to spin their cocoons.

It has Comb Frame Stops,

By which the comb frames are held in place, and which are lacking in the Langstroth and other moveable-comb hives, having been, with other important features, invented and patented by myself.

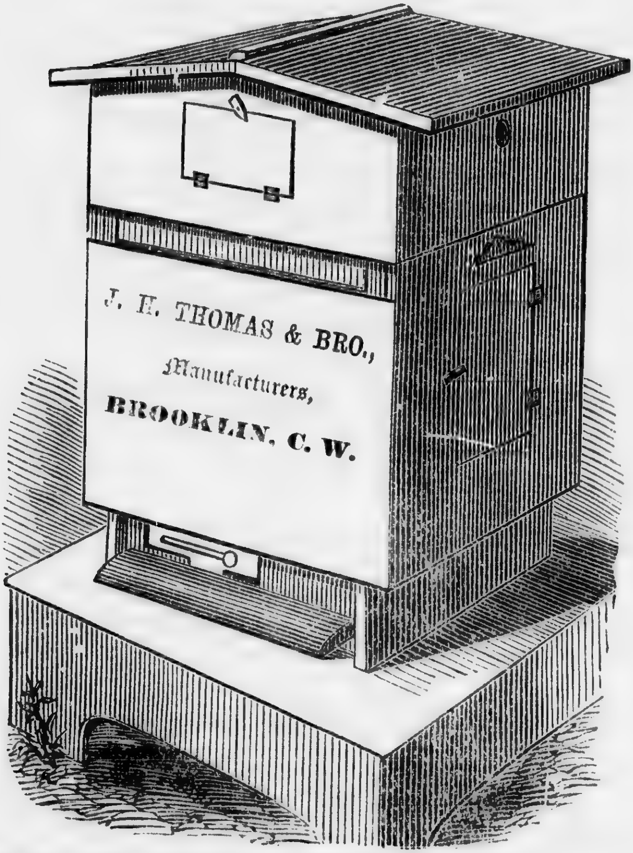
It has Revolving Bands which are a Great Advantage,

First, by allowing the apiarian to remove the frames with far less difficulty and in one quarter of the time that it takes with any other hive I have ever seen. *Secondly*, the front band may be turned down, forming a lighting board for the passage of the bees into the honey-box by a short route through the hot air chamber,

It has a Water-Tight Cover Bearing,

By which any water is prevented from running into the hive, making the bees perfectly secure from wind or water, no matter how much the hives may be exposed. In fact, it has advantages not possessed by any other hive with which I am acquainted; is simple in construction and easier to operate with, which I am ready to demonstrate at any time by comparison. (See opinions of the press.)

THE DOUBLE-BOARDED HIVE.



Description and Advantages of the Donble-Boarded Self-Protecting Hive.

The Double-Boarded Hive

Is made upon the same principle as the single-boarded hive, possessing the same advantages, and more, for those who intend to winter their stocks out of doors. For all purposes, it is the best hive; for being double-boarded, a hollow wall is formed all around the bees, which makes it much warmer in winter, and cooler in summer. There is no danger of the combs melting down in the double-boarded hive. This has been fairly proved. In fact, it is just what it claims to be, *a self-protecting hive.* I would say, furthermore, that the hives were invented and designed for this climate, and I flatter myself that they are calculated to meet the wants of the Canadian bee-keeper. They were awarded extra prizes at the Provincial Fair held at Hamilton, 1864; also first and second prizes at the Ontario County Fair.

These hives, with individual or territorial rights, and all articles necessary for an apiary, may be had at the following prices of J. H. Thomas & Bros., Manufacturers, Brooklin, C. W.

All freight, express, or postal charges, to be paid by the purchaser.

PRICE LIST.

Prices of the different kind of hives, including an individual right to make and use both Single and Double-boarded Hives, with full description thereof:—

Single-boarded Hive	$5 00
Double-boarded Hive	7 00
Single-boarded Observing Hive, glass in one side	6 00
" " " glass in two sides	8 00
" " " glass in three sides	10 00
Double-boarded Observing Hive, glass in one side	8 00
" " " glass in two sides	10 00
" " " glass in three sides	12 00
Honey-boxes, glass in both ends, hold 25 lbs., per dozen	3 00
Extra Comb-frames, per set of eight frames	0 50
" " per 100 frames	5 00
Honey-Knife, best spring steel	1 00
Bee-hat, can be worn by lady or gentleman, is a perfect safeguard against any attack of bees; can be sent in a hive	0 50

Bee-protector, can be worn on any hat, by lady or gentleman; answering every purpose of a bee-hat....	$0 40
Bee-gloves, India rubber, and a splendid article; bees cannot leave their stingers in them; if besmeared with honey or dirt, they can be washed the same as the hands..................................	1 50
Bee-gloves, sheepskin; may be used for harvesting....	0 75
Fumigator, or Smoke-pipe, may be usad with the mouth or on a hand-bellows...........................	0 25
Patent Metallic Gauge, which may be attached to any hive, even a common box-hive, for the purpose of shutting out drones, preventing robbing, shutting in the bees, &c.............................	0 12½
Do. per dozen..................................	1 00
Canadian Bee-keepers' Guide (postage 3 cts.)........	0 25
Five copies, to one address (postage 10 cts.)..........	1 00
Twelve do., (postage 25 cts.)......................	2 00
Italian Queens, with full instructions for introducing, sent by express; safe arrival guaranteed........	5 00

It will be seen by the above List of Prices that any person sending $5 will receive in return a Single-Boarded Hive, and an individual right to make and use both the Single and double boarded Hives. Any person sending $7 will receive in return a Double-Boarded Hive, and an individual right as above. Or, any person sending the price of any of the Observing Hives, will in return get the hive ordered, and a right as before stated.

But if any person, after having purchased a hive and right, should prefer to order hives of J. H. Thomas & Brothers rather than make, they can obtain them at $2 less than the prices given in the price list; that is, Single-boarded Hives, $3; Double boarded Hives, $5, and so on.

Country and Township rights for sale at low prices. Agents wanted to sell hives throughout Canada. Any information given by mail relative to the management of bees, free of charge, if a stamp is enclosed to pay postage.

All letters to be addressed, post-paid, to

J. H. THOMAS & BROS.,
Brooklin, C. W.

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CHAPTER VII.

Italian Bees.

Italian Bees, sometimes called Ligurian bees, are found in Northern Italy and Southern Switzerland; are described by Aristotle, Virgil, and other ancient writers, as "small and round in size and shape, and variegated in colour," and the most valuable of any then known. For many years they were entirely lost sight of, until they were accidentally discovered. Captain Baldenstein, while stationed in Northern Italy, in the wars of Napoleon, who, after returning to his castle in Switzerland, procured, in 1843, a colony near Lake Como, and transported them over the Alps to his Northern home. They were, I believe, introduced into Germany by Mr. Dzierzon in 1853, and soon became very popular. The first successful importations into this country were made in 1860, by Messrs. S. B. Parsons, of Flushing, L. I. P. J. Mahan, of Philadelphia, and R. Colvin, of Baltimore. In 1861, Mr. O. W. Rose, of New York City, succeeded in bringing six colonies to this country out of forty-nine purchased in their native district, since which many other importations have been made. It is said that those imported by Mr. Rose, of New York, are lighter in colour than those imported by S. B. Parsons. There is, however, no difference, in quality. All pure Italians are distinctly marked with orange or golden-coloured girths around their bodies. The form of the workers is long and graceful, their abdomen tapering to a point like a queen. It is now generally admitted that they are far superior to the common, or black bee, being far more active and industrious, often extracting honey from flowers that the common bee cannot. Of this, however, I cannot speak from experience, this being the second year that I have had them. For a long time I was fearful that the many accounts of their superiority was but the "gassing" of some wordy cousin in order to make sale of a "Yankee Humbug." But after searching more into their history, and receiving the reports of both German and American apiarians, whose veracity could not be questioned, I became fully convinced that they were worthy of attention, and deserving of much that was claimed for them. I then purchased a queen of Mr. Holden, of Merrickville, C. W., and so fully convinced am I of their superiority, that I have determined to keep no other, and fully believe that ere long the black race will entirely disappear and the golden-coloured Italian take their place. Mr. Holden informed me, this spring, when at his place, that last year, 1864, his Italians averaged him 40 lbs. surplus honey from each stock. He also

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informed me that he visited Mr. Quinby, of St. Johnsville, N.Y., who now has over 500 stocks of Italians, and that he (Quinby) informed him that in 1863 he had to feed nearly all his stocks of black bees in the fall, while all his Italians had plenty, and from some he took surplus honey. Mr. Quinby has one of the largest apiaries in the United States, and from which he has amassed a fortune, yet he does not reside in as favourable a locality for bees as almost any part of Canada.

I will also give the testimony of several well-known apiarians, that the reader may be a better judge whether the new variety is worthy of his attention. The Baron of Berlepsch, a skilful bee-keeper, of Germany, says, he has found "1st. That the Italian bees are less sensitive to cold than the common kind. 2nd. That their queens are more prolific. 3rd. That the colonies swarm earlier, and more frequently. 4th. That they are less apt to sting. 5th. That they are more industrious." Mr. E. A. Brackett, writing to the *American Agriculturist*, says: My experience thus far satisfies me that they have not been overrated. The queens are larger and more prolific. They are less sensitive to cold and more industrious."

From J. P. Kirtland, Cleveland, Ohio, September 13, 1860:—"*First*. Their disposition to labour far excels that of the common kind.

"*Second*. Power of endurance, and especially of resisting the impression of cold, they possess in a marked degree.

"*Third*. Prolificness they equally excell in. Both my full and half-blooded stocks have become numerous, and strong in numbers, as well as in stores, at this late season of the year, when the common kind have ceased increasing, and have become nearly passive.

"*Fourth*. Their individual strength is greater; and this is well illustrated in their prompt manner of tossing to a great distance any robber that chances to approach their hive.

"*Fifth*. Their beauty of colour and graceful form render them an object of interest to every person of taste.

"*Sixth*. Of their moral character, I cannot speak favourably. If robbery of weaker colonies is going on, these yellow-jackets are sure to be on hand. So far as my experience has gone with them, I find every statement in regard to their superiority sustained."

The testimony of many others might be given, but it will not be expected, in so small a work, a full history of the Italian bee, with all the accounts of their superiority can be given; neither is it necessary, as they have become pretty well known.

How to Italianize a Common Stock.

In order to Italianize a common stock without difficulty, it is necessary to have the bees in a moveable-comb hive; then write to J. H. Thomas & Bros., Brooklin, C. W., or to H. Holden, Esq., Merrickville, C. W., and order an Italian queen. Eight days before introducing her, you will examine your stock, find the queen, and take her away; in four or five days cut out all queen cells, as the bees will have started a number; on the eighth day examine again, and if any other queen-cells are started, cut them out. Now take your Italian queen, put her in a glass tumbler with four or five of the bees which were in the box with her, tie a piece of wire-cloth over the top of the tumbler, and turn the tumbler over on the top of the comb-frames where the bees can get to her, put on the cover of the hive and let her remain thirty-six hours; the bees will feed her through the wire-cloth, and at the end of that time will receive her, and you may let her loose among them, putting a few drops of honey on her as she runs out of the tumbler. Let it be remembered that all the eggs this queen will lay during her life will produce pure Italians.

How to Italianize the whole Apiary.

If all the bees are in moveable comb hives, the next season it will be necessary to cut out all drone comb from the other stocks, or kill them as fast as they appear, allowing your Italian stock only to produce drones; as soon as drones have appeared, the Italian queen may be removed and given to another stock. The Italian stock will at once commence to raise another queen, and will start from two to twenty; as fast as they are capped over they may be removed and given to other stocks of black bees, provided, of course, that their queen has been taken away, and all queen-cells destroyed for eight days. One queen-cell may be left in the Italian stock to mature, or the old queen may be returned. Or after she has deposited a number of eggs in the cells of the stock to which she was transferred, she may be given to another stock, and so continue to do until she has deposited pure Italian eggs in all your stocks, from which they would raise pure Italian queens; and if all your *common* drones were destroyed, they would stand a good chance to mate with your Italian drones, and their progeny would then be pure. If, however, there are common bees within three miles, they may sometimes mate with a common drone, in that case they would produce impure workers—half-breeds; but would produce pure drones, and hence would be good to give to your neighbour's bees, in order to have the neighbourhood filled with pure Italian drones.

CHAPTER VIII.

Profits of Bee Keeping.

If people could be convinced that bee keeping is profitable, I verily believe that the so much dreaded stings of the honey-bee would lose their terror, and there would be a far more general rush into bee culture; and Canada become, if not like Ancient Palestine—"a land flowing with milk and honey"—at least a land flowing with milk and not *lacking* for honey. Now, I do consider that bee-keeping is a profitable enterprise; if not so in Canada, it certainly is with our neighbours across the water. When it has been as fairly tried with us as it has with them, I believe that it will be acknowledged to be not only pleasing and instructive, but highly remunerative. Let us suppose that a young man at the age of fifteen obtains two stocks of bees, and commences bee-keeping fully determined to make it profitable. Allowing that he doubles his stock every year, which every bee-keeper should be able to do, and that his yearly average of surplus honey from each stock is fifteen pounds, which is a very low average, at the end of ten years his apiary account would stand thus:—

		Dr.	
To 2 stocks, at $10 each	$	20	00
" 2.048 moveable-comb hives, including honey-boxes, at $3 each		6.244	00
" 1,021 extra honey-boxes, at 20 cts. each		204	20
" $404 78 per annum for labour and incidental expenses		4,047	80
		$10,516	00
		Cr.	
By 2,048 stocks, at $5 each		$10,240	00
" 61,380 lbs. surplus honey, at 20 cts.		12,276	00
		$22,516	00
Debits deducted		10,516	00
Profits		$12,000	00

A snug little sum with which to commence business at the age of twenty-five. I do not expect that every young Canadian who may commence bee-keeping will realize profits to such an extent, yet there are the figures, which cannot be disputed, and which at least show that bee keeping may be made profitable. Perhaps it may be thought by some that twenty cents per pound for honey is too large a figure. It may be for our Canadian market, but it is well known that twenty cents or even more may be realized by shipping to New York or Chicago. Not only so, but in the above estimate, I have only allowed fifteen pounds of honey from each stock as the average yield, whereas it might be set at twenty, and still be a low average. Again, others may suppose that good moveable-comb hives cannot be obtained for $3 each, but it will be seen by reference to price list, that all persons having first purchased a hive and right, may obtain from J. H. Thomas & Bros., my hives at that price; or having the right they may, if they choose, manufacture for their own use at a cost much less than the above. It will be seen also that stocks in the Debit account are estimated at $10 each, while in Cr. account they are estimated at the low figure of $5 each.

In order, however, to still further demonstrate that bee-keeping is a profitable enterprise, I will give a few statistics, showing what enormous profits have been realized by certain individuals. A gentleman writing from St. Albans, Vt., to Mr. K. P. Kidder, of Burlington, Vt., on the 15th August, 1863, says:—"From my glass hive I have taken and weighed 130 lbs. There are two boxes filled, and nearly capped over, of 24 lbs. each. making altogether from my glass hive 178 lbs. The hive is full besides, and has cast one good swarm. I have other stocks, from which I have taken from 70 to 100 lbs; one young swarm from which I have taken 80 lbs."

It will be understood, however, that these were Italian stocks.

In 1859, Mr. A. W. Ford, of Middleville, N. Y., from 130 stocks, received an increase of 170 swarms, 6,000 pounds of surplus honey, sold honey at 20 cts., and swarms at $4, making an income of about $1.800. Bidwell Bros., of Minn., writing to the *American Agriculturist*, for January, 1865, say:—"Last spring our apiary consisted of 1 Italian and 58 stocks of black bees, all in frame hives. We have increased our one Italian stock to 15, our 58 stocks of black bees to 181, principally by artificial swarming. We have taken from the first new swarm, in boxes 22 lbs. honey; 2nd, 126 lbs.; 3rd, 88 lbs.; 4th, 74¼ lbs.; 5th, 29½ lbs., making from the 7 hives 339¾ lbs. * * * We shall Italianize our whole apiary next season. The average weight of our stocks, less hives, bees, &c., is about 58 lbs. of honey. We have taken off in glass boxes, 1.208 lbs., and 1,301 in caps. The honey from this apiary would, at 25 cents per pound, amount to $700."

In THE CANADA FARMER for February 1, 1864, J. V. points to the proceeds of one stock (in 20 years) in the shape 219 acres of land in a favourable locality. Such are the almost fabulous accounts of the profits of bee-keeping coming from different quarters, and yet well authenticated, and taken in connection with my own observation and experience, I conclude that bee-keeping in Canada may yet not only become a source of pleasure and profit, but yielding for every household in city, town or country a luxury that would grace the table of a prince. Could our young men and young ladies, who now spend hours in idleness or vain amusements, be induced to purchase a stock of bees and commence bee-keeping upon their own account, it would not only prove remunerative, but would lead them into habits of industry, and fit them for better citizens. Large amounts of delicious sweets from every field and forest would then be gathered in, thus saving to the country annually thousands of pounds of pure honey that now perishes in the golden cups of the flowers that deck this brown earth, for want of bees to gather it.

CHAPTER IX.

MISCELLANEOUS.

Bee Pasturage.

The prosperity of bees in any locality must depend much upon the amount of bee pasturage. In some localities it is abundant from early spring until late in the fall, nature having lavishly bestowed there her wild flowers. In other localities it is quite different. The section of country where I reside does not abound with wild flowers, and in the fall, especially, the bee pasturage is quite limited.

This difficulty may be easily obviated by the more extensive sowing of buckwheat, and the introduction of the Swedish white clover. It is equally as good, or better, for hay and pasturage, and yields a far greater supply of honey, and of a superior quality, than the common white clover. Every farmer should endeavour to get it, especially if he keeps bees; then by sowing a small quantity of buckwheat, every locality would abound in bee pasturage, and every bee-keeper be repaid for his trouble fourfold. In fact, if it were not for the buckwheat crop, in some localities, bee-keeping would prove a failure. It is estimated that an acre of buckwheat will yield an average of 14 pounds of honey daily.

Over-Stocking Bees.

In Mr. Langstroth's valuable work on the *honey-bee*, we find statements from Mr. Samuel Wagner, in which he says, that the present opinion of the correspondents of the *German Bee Journal* appears to be that a district cannot readily be over-stocked, and Dzierzon says, in practice, at least, "*it is never done.*"

In Russia and Hungary, apiaries, numbering from 2,000 to 5,000 colonies, are frequent; and 4,000 hives are sometimes congregated in autumn on the heaths in Germany. The average number of stocks to one square mile in Lombardy, Austria, is said to be 360; in Corinthia, 500; in Carniola, 900. It would appear, then, that there is but little danger of over-stocking, especially if the seasons remain at all favourable. The flower cups which are emptied to-day, may be visited again to-morrow; for if left to wither, their stores are lost.

Moving or Transporting Bees.

Bees may be moved to any distance at any time. The best time, however, is in the spring, as the combs contain less honey then than at other times, hence are not so heavy. Box-hives should be inverted and the bottom covered with wire-cloth. My hive should have a piece of wood one inch square, twelve inches long, with eight notches cut to fit the bottom of the frames, laid across the bottom board which may then be closed; the frames will then rest in the notches, which will prevent their moving.

How to Ascertain the Amount of Honey in a Hive.

Weigh the hive before the bees are put into it, and mark the weight on it, then in the fall, before putting into winter quarters, weigh the stock, deduct the weight of the hive, and 12 lbs. for bees and brood, and the remainder will be the amount of honey near enough for all practical purposes.

Bees-Wax—How to Make.

Take a course linen sack or strainer, put your comb into it, with small stones enough to sink it; tie tight and boil in a kettle of water, pressing and turning it frequently, until the wax ceases to rise, which may be taken off from time to time with a skimmer. The first taken off will be the purest. The whole may then be melted and run through a finer strainer into dishes to cool. To clean the dishes from wax, heat hot and rub with a course cloth, or wash with very hot water.

How to Make Candied Honey as Good as New.

To every two quarts, add half a pint of water, bring to a boiling heat and skim.

Honey—To Prevent Candying.

Put into a bottle or jug set into a kettle of water, bring the water to a boiling heat and keep it so for 15 minutes, then cork up the honey and it will keep almost any length of time. Maple molasses may be kept in the same manner.

How to Make Good Bee-feed for Winter Use.

Take 3 lbs. white sugar, add one quart of water, bring to a boiling heat, and it is ready to use. If honey can be had, one pound may be added to the above quantity. For feeding in the spring, common sugar will do.

Questions Answered.

How long will a queen live? From 4 to 5 years.

How many eggs will a queen lay per day? From 1,000 to 2,000.

How long will a queen remain fertile? From 3 to 4 years.

What is the result of a queen becoming unfertile? She will lay drone eggs only.

How may an unfertile queen be known? By her laying drone eggs in worker-cells.

How long does it take to produce a queen from the egg? About 16 days.

Will the queen sting if taken in the hand? No.

How long do workers live? From 6 to 8 months.

How long does it take to produce a worker from the egg? About 20 days.

How long do drones live? From 2 to 4 months.

How long does it take to produce a drone from the egg? About 24 days.

Will bees do well in a town or city? Yes.

Do they injure fruit or fruit blossoms? No.

Can a stock be injured by casting too many swarms? Yes.

Will it make bees more irritable to smoke them often? No.

Will it injure a stock to remove the combs often? No.

How far will bees travel for pasture? About 3 miles.

Is there any danger of over-stocking? No.

When do bees require the sun? All the day in spring; morning and evening in the summer.

Where is the best place to winter bees? In a house built for the purpose.

What kind of sugar is best to feed bees? White sugar.

Will it do to feed bees poor sugar? Yes, in the spring.

How can sugar be prepared for feeding? See "Bee Feed."

Will it pay to feed weak swarms through the winter? Not as a general thing.

When is the best time to feed bees? In the fall.

How many bees in a swarm? From 10,000 to 30,000.

How many drones in a swarm? From 500 to 4,000.

When are bees the most irritable and likely to sting? In hot weather.

What is good for a bee-sting? Honey, apply at once.

What is the weight of a swarm of bees? From 6 to 7 pounds.

What is the weight of the brood and comb? About 12 pounds.

What is the best kind of hive? A moveable comb hive.

Are drones required to keep up the necessary heat in a hive? No.

How often should bees be examined? As often as necessary.

Can a queen be shut in a hive and the workers go out? Yes.

Will workers eat the eggs of the queen? Sometimes.

Do bees require water? Yes, especially in the breeding season.

Do bees ever die of a disease called dysentry? No.

Things Worth Knowing.

How to prevent swarming. Cut out queen cells.

How to keep combs from melting down, Use J. H. Thomas' Double-Boarded Hive.

How to keep mice out of hives. Cover all holes with wire-cloth.

How to get honey out of honey-box. See directions.

How to know when bees are robbing. See directions.

How to prevent robbing. Contract the entrance.

How to winter bees successfully. Follow directions given in this book.

How to keep bees successfully. Keep strong stocks.

How to know that you are getting a good bee hive. Order of J. H. Thomas & Bros.

How to avoid being stung. Buy and use J. H. Thomas' bee hat.

How to know when bees want more air. See if bees are at the entrance blowing.

How to build up a weak stock. Exchange frames with a strong stock

How to handle bees without being stung. Handle carefully.

How to handle bees and be stung. Handle roughly.

How to spend 25 cents profitably. Buy the *Canadian Bee-Keepers' Guide.*

OPINIONS OF THE PRESS.

From THE CANADA FARMER.

A work entitled "The Canadian Bee-Keepers' Guide," has just been published, which is, in our view, the very thing. Its author is Mr. J. H. Thomas, of Brooklin, C. W., one of the most skilful and experienced bee-keepers in Canada. It contains information of great value to all who keep bees or intend doing so. We have carefully read the work in its advanced sheets, and have no hesitation in giving it the most unqualified commendation. It is practical, straightforward, plain, and comprehensive.

From the Markham Rural Economist.

Mr. J. H. Thomas, of Brooklin, has written an excellent little work called "The Canadian Bee-Keepers' Guide." It is especially adapted to this country, and contains a fund of information in regard to bee-keeping.

From the Merrickville Chronicle.

CANADIAN BEE-KEEPERS' GUIDE.—We have received a copy of a neat little work of 72 pages, bearing the above title. To bee-keepers its contents are invaluable, and to the novice in bee management it is the one thing needful. Possessed of this instrucfor the unskilled will be able to meet every emergency likely to arise in his apiarian science.

From the Smith's Falls Review.

Without hesitation we can say that from it more is to be learned concerning the habits, management, &c., of bees than from any work extant. No difficulty with which it is possible to meet but what is treated upon, so that the veriest novice in the apiary, by merely referring to it, can be a successful bee-keeper.

The price of the "Canadian Bee-Keepers' Guide," is 25 cents for 1 copy, $1 for 5 copies, and $2 for 12 copies. Persons ordering by mail must remit 3 cents to cover postage on a single copy, 10 cents for 5, and 25 cents for 12 copies.

From the Toronto Globe, 1864.

NOTICE OF THE PROVINCIAL FAIR.—Happily much interest is being awakened all over the country in bee-keeping, and we are glad to see Messrs. THOMAS, of Brooklin, and SCOTT, of Yorkville, on hand with their hives. These hives attracted a great deal of attention, especially those of the Messrs. THOMAS, from the fact that one of them was inhabited, and from time to time the proprietor showed the convenience of the hive and the quietness of the bees by opening and exposing the comb, frames, and busy workers. There would be a general rush into bee-keeping if people were not afraid of being stung. By taking certain little precautions this danger may be completely obviated, and the most absolute control maintained over the "little busy bee." The Messrs. THOMAS demonstrated this to the satisfaction of all who witnessed their exhibition of hives and bees.

From THE CANADA FARMER, 1864.

THOMAS' MOVEABLE-COMB OBSERVING BEE HIVE.—We have had an opportunity of carefully ,inspecting this hive, and think it an excellent one. It is well made, of convenient size, is fitted up with moveable frames of the most approved construction, and has glass windows which afford the fullest opportunity for observing the bees without at all disturbing them. The makers, Messrs. J. H. Thomas & Bros., Brooklin, C. W., intend exhibiting their hive at the coming Provincial Exhibition, and we advise all who keep or intend to keep bees, to examine it. By reference to our correspondence columns, it will be seen that Dr. Holden, of Merrickville, an experienced apiarian, thinks this hive "the best yet."

From MR. HOLDEN, *an experienced Apiarian*, 1864.

THE BEST BEE HIVE.—"As I am constantly asked by parties ordering Italian queens which is the best hive to use, in reply, I would state a good Moveable-Comb Hive is the best in use. I have used several kinds of them for the last six years, of American manufacture, but I am proud to say we have hives manufactured in Canada that are superior to any of them. I received one from J. H. Thomas & Bros., of Brooklin, C. W., a short time since, and find it the best hive I ever saw. I understand they are to exhibit one at the coming Provincial Fair, and would advise all parties interested in bee culture to be sure and examine it."

From the Oshawa Vindicator, 1864.

NOTICE OF THE OSHAWA FAIR.—"Messrs. J. H. Thomas & Bros., of Brooklin, also had their colony of bees on hand, together with samples of their Improved Bee Hives, and gave a lecture on the nature, habits, and management of the bee, illustrating it by performances as they proceeded. They exhibited that wonderful insect, the queen bee; showed the convenience of their Moveable-Comb Hive, by taking the comb, bees, and honey into half a dozen pieces, while searching for the queen. This portion of the exhibition proved nearly as attractive as the floral hall."

ADVERTISEMENTS.

Italian Queen Bees.

Having bred them very carefully upwards of four years, I am prepared to furnish queens of undoubted purity. Price, with full instructions for introducing, $5.00. Purity and safe arrival by express guaranteed.

Merrickville, C. W. H. HOLDEN.

Italian Queens.

We are now prepared to furnish to order Italian Queens, with full instructions for introducing. Price $5.00. Their purity and safe arrival guaranteed. Also, all articles necessary for the proper management of an apiary. See List of Prices.

J. H. THOMAS & BROS.,
Brooklin, C. W.

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